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WORKSHOP PROCEEDINGS

May 25 and 26, 1993

Toronto, Canada


Lower Don Lands Site Remediation

Challenges & Opportunities

WATERFRONT REGENERATION TRUST



1993-94 WORKSHOP SERIES



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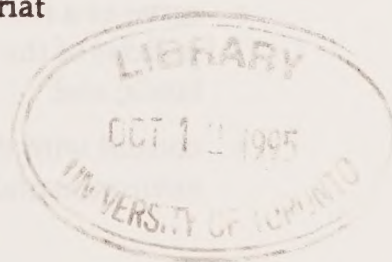
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About the Waterfront Regeneration Trust

The Waterfront Regeneration Trust was created by the Government of Ontario in June 1992 as a Schedule II Provincial Crown Corporation, and reports to the Legislature through the Minister of Municipal Affairs.

The responsibility of the Trust is to advise the Province on matters affecting the Lake Ontario waterfront from Burlington Bay to the Trent River. In carrying out this role, the Trust acts as a facilitator, bringing parties together, developing agreements on waterfront objectives and the means of achieving them, including priorities, timeframes and deadlines. As the Provincial steward of the waterfront, the Trust advises the Province and the private sector on the overall provincial interest in and public values of the waterfront.

The specific mandate of the Trust is to:

- establish a waterfront trail from Burlington Bay to the Trent River;
- co-ordinate programs and policies of the Government of Ontario and its agencies relating to waterfront lands;
- advise the Province on any matters relating to the use, disposition, conservation, protection, and regeneration of waterfront lands;
- serve as a resource centre and information clearinghouse for policies of the Government of Ontario relating to waterfront lands; and
- consult with the public to determine the public interest in the environmental integrity of the waterfront lands.

The Province has specifically requested the Trust to undertake five priority projects in the first two years of operation. They include:

- Lake Ontario Greenway Strategy;
- Garrison Common Implementation;
- Lower Don Lands Strategy;
- Toronto Central Waterfront Transportation Corridor Improvements Program; and
- Waterfront Partnership Agreements.

About the Canadian Urban Institute

The Canadian Urban Institute was founded in 1990 by the City of Toronto and Metropolitan Toronto as a not-for-profit charitable corporation with the following purposes:

- enhance planning and policy making in urban areas, and hence the quality of urban life, by developing and promoting a better understanding of contemporary urban issues, and by fostering co-operative approaches that involve government, business, academic and other perspectives.
- serve as a window for decision makers in the Toronto region on urban issues and solutions elsewhere, particularly outside Canada; and equally to provide a window on the management of the Toronto region for people from elsewhere, to achieve a sharing of expertise and mutual benefit.
- conduct applied research and training to provide a means of enhancing the skills and collaboration of all who play a part in the stewardship of urban regions.

The participation of the Canadian Urban Institute in the Site Remediation Workshop was sponsored by the Ontario Ministry of Housing.

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Preface

The Waterfront Regeneration Trust is co-ordinating preparation of a strategy to guide the redevelopment of a specific area of the Greater Toronto Bioregion known as the Lower Don Lands, approximately 688 hectares (1,700 acres) strategically located at the mouth of the Don River just east of the financial district in Toronto. The strategy will integrate environmental protection and remediation, land use, and community, economic, and transportation planning.

As part of this initiative, on May 25 and 26, 1993 the Trust, in partnership with the Provincial Government (the Ministry of Environment and Energy, the Ministry of Housing, the Ministry of Municipal Affairs and the Ontario Management Board Secretariat), the Canadian Urban Institute, and private-sector companies hosted a site remediation workshop to focus on the needs, barriers, and opportunities for the regeneration of contaminated lands in the Lower Don Lands.

This record of the proceedings is based on the speakers' presentation notes, where those were available, and on notes taken by Trust and CUI staff throughout the two-day workshop.

*The Honourable Ed Philip,
Minister of Municipal Affairs, Province of Ontario*

Introductory Comments

It is indeed a pleasure to welcome all of you here today. As the Minister of Municipal Affairs, I know that one of the big problems that our cities are facing is the clean up of contaminated lands. Certainly, in my own riding of Etobicoke-Rexdale the issues that you will be addressing over the next two days are fundamental to the economy and health of the community.

I would particularly like to note the co-operative effort that has gone into planning this workshop. I appreciate the role of the Trust and the Canadian Urban Institute in bringing private and public-sector interests together for this two-day event. The participation of the ministries of Municipal Affairs, Environment and Energy, Housing, and the Management Board Secretariat is a recognition that this government understands that solutions need to encompass a wide range of perspectives.

I extend a warm welcome to our visitors from British Columbia, the United States, and Germany. Site remediation is not an issue that we face in Canada alone, but must be dealt with by all industrialized countries. Through these multi-sectoral efforts Ontario is creating excellent land remediation technologies that will be of interest world-wide.

In environmental issues, the Government of Ontario is moving away from a rigid policing role and toward the role of facilitating solutions. We will strive to facilitate relations between business and regulatory bodies. The financial institutions are concerned about financing development on potentially contaminated sites but there are answers and there is a clear role for the private sector to play in finding those answers. It is gratifying to see the private-sector sponsors for this workshop.

There is no better example of the need to deal with contaminated sites than the Lower Don Lands which comprise 688 hectares (1,700 acres) in the heart of Toronto. This land represents only potential until it is cleaned up. This workshop is an important step and I wish you success and productive discussion.

Maureen Farrow
President, Economap
*Economap is a Toronto consulting group specializing in strategic
economic advisory services for business and government*

An Economically Competitive Waterfront

The Toronto waterfront has not always been recognized as the major regional asset it is, but there is now a growing awareness that the waterfront's natural advantage is also a competitive advantage in the global economy.

WATERFRONTS IN THE 21ST CENTURY

If older industrial economies are to survive in the 21st century, and to remain competitive, there must be an understanding of the nature of maintaining and building competitive advantage.

While it is difficult to imagine the future, we can predict that future generations will want the Toronto waterfront to be clean, accessible, beautiful and with enhanced natural areas. Therefore, it will have to provide a balance between being a productive asset and a social recreational asset. In order to ensure that value is added and is offered in a balanced way, we must understand the world we live in and the interaction of the global economy on local and regional interests.

THE GLOBAL ENVIRONMENT

Events of the past decade have demonstrated that local economies are being increasingly affected and reshaped by forces beyond their local boundaries and often beyond their control. A number of key forces are shaping the global environment as we move towards the 21st century and, in husbanding the resources of the waterfront, attention must be paid to these new dynamics. In particular, attention should be paid to political and economic realignment, the growth of Asia, new trading patterns and technological change.

Hindsight shows that the cold war gave us a period of relative global and economic stability which now appears to have come to an end. With the fall of the Berlin Wall and the collapse of communism in the former Soviet Union, the world continues to witness major political and economic realignment. Along with the political changes goes economic transformation as China and the former Soviet Union embrace market-driven economic principles.

For several decades the centre of global manufacturing has been shifting away from North America and Europe to the Pacific Rim as companies have been forced to reduce costs in order to remain competitive. The result has been the rapid industrialization and growth of countries like South Korea, Hong Kong, Singapore, Taiwan, Thailand and Malaysia. In recent years, the two sleeping giants of Asia — China and India — have also started on the road of change. This region of the world is expected to witness significant expansion over the coming decades as it continues to act as a prime centre of consumer goods manufacturing in the global economy.

These political and economic developments are resulting in a significant shift in trade patterns with the manufacture of consumer and industrial products centred in Asia and the manufacture of higher value-added goods like electronic, computer-related, and biotechnology expertise and products becoming concentrated in the Organization for Economic Co-operation and Development (OECD) countries. Likewise, the opening up of the large resource bases of the former Soviet Union and South American trade in natural resources will shift away from the traditional suppliers — Canada, Australia and Scandinavia — to be shared with these new resource power regions.

Communications technology is also reshaping the global economic order. Advances in communications technology have simplified and speeded up the flow of market, financial and operational information across countries and continents with the result that national geographic boundaries have become blurred.

These forces have intensified competition in traded goods and services. To succeed, companies must now have access to strategic global markets and, as a result, the world is currently witnessing the redrawing of national boundaries and new economic and politically associated regions are being created. The decade ahead will likely see further consolidation and focus, with five key regional trading areas crystallizing: North America, South America, Europe, Japan and Asia.

These forces mean that the business environment in which the waterfront operates has changed and demands recognition of these shifts in order to

be able to play its constructive role in positioning the Toronto region for the 21st century.

ECONOMIC LEVERS FOR THE 21ST CENTURY

The economic levers for the industrialized countries have now changed to reflect the technological and market shifts. The OECD economies are moving from being based on an electro-mechanical infrastructure to a computational infrastructure. This means that computers progressively take over routine activities and thereby facilitate a new set of work activities and ways to interact. This fundamental shift is giving birth to an intensification of the knowledge-based economy. Toronto needs to build its future on the developments of this new innovative economy. The Toronto region is well positioned to follow this development trend being the Canadian centre for education, medical science, telecommunications and financial services. Business development around

WELL POSITIONED SECTORS

NEW ECONOMY SECTOR

- Pharmaceuticals
- Telecommunications Equip.
- Project Engineering
- Banking/insurance
- Computer/Software
- Environmental Protection
- Business Services
- Health Products
- Communications

TRADITIONAL ECONOMY SECTOR

- Mining Non-Ferrous Metals
- Aluminum
- Petrochemicals
- Lumber
- Plastic Fabrication
- Mass Transit Equip.

AGE RELATED SECTOR

- Funeral Homes
- Recreation
- Landscaping/Gardening

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the waterfront must understand these changes and development should focus on value-added knowledge intensive activities.

DEMOGRAPHICS AND THE WATERFRONT

The demographic profile is changing. Although the population continues to grow, the age and ethnic mix is shifting. Half of the population growth now comes from immigration. The population profile is now also on an aging trend, with the number of children declining and the older age groups increasing. With these changes slated to occur over the coming decades, the waterfront must be designed to meet the changing needs of an older population and be sensitive to the ethnic mix of our society.

FISCAL RESTRAINT AND THE WATERFRONT

The high levels of government debt in Canada means that over the next decade fiscal restraint will limit government's ability to finance development. This means that in order to finance new development on the waterfront, new partnerships must be formed which can find a common vision and workable solutions.

POSITIONING THE WATERFRONT

My remarks have briefly focused on the changing business environment of the waterfront within which the development of the waterfront must occur. More and more, these changed realities will offer opportunities, but will require a clear understanding of the long-term vision of this valuable resource in order to avoid the pitfalls of short-term thinking. I urge that the waterfront be regarded as a unique natural resource for Toronto which could enhance the area's competitive advantage in this global economy. It is imperative that we consider what this unique resource should contribute to future generations and avoid the short-term thinking that resulted in features such as the Gardiner Expressway. Our challenge is to consider the future from the global perspective in order that a dynamic healthy waterfront is our heritage.

Case Study 1: The German Experience

**1.1. The Frankfurt Project: Stadtviertel Alter Schlachthof
(Housing on the Historic Slaughterhouse Site)**
presented by Martin Hunscher, City of Frankfurt Planning
Department

1.2 The City of Bottrop
presented by Gerhard Seltmann and Colleen Schmitz,
International Building Exhibition Emscher Park

CASE STUDY 1.1: THE GERMAN EXPERIENCE

Martin Hunscher
City of Frankfurt Planning Department

The Frankfurt Project: Stadtviertel Alter Schlachthof (Housing on the Historic Slaughterhouse Site)

THE CITY

Frankfurt am Main is the centre of the Rhein-Main agglomeration, which is an urban region of 4,000 square kilometres (1,544 square miles) with some four million inhabitants, and is an important housing and employment market. Frankfurt am Main itself occupies only five percent of the land in the region but has a population of 570,000 and provides 560,000 jobs. It is one of Europe's important banking and commercial centres because of its location in the central European transportation junction. Traditionally, Frankfurt am Main has had only a few industrial zones, located in the suburbs and at the harbour area on the Main River.

The 1970s and '80s were characterized by suburban growth. Now, against all forecasts, residents in the Rhein-Main area are moving into the cities. The resulting increase in demand for urban housing has been especially strong in Frankfurt am Main, creating a current housing shortage of nearly 20,000 dwelling units. This increasing demand in an area with a limited supply of land is creating an economic crisis of high land and housing prices in the city.

DEVELOPMENT PLANNING/DEVELOPMENT POTENTIAL

In response to this situation, the city is planning for new development on agricultural land at its fringe, and for redevelopment of derelict and underdeveloped land in the inner city.

The City of Frankfurt am Main has rezoned several potential redevelopment areas for new uses; these include former industrial areas and the former bases of American forces in Germany. However, the most important project is the "Frankfurt Waterfront Project".

THE FRANKFURT WATERFRONT PROJECT

In 1989, the city government of Frankfurt am Main decided to raise the value of an area along the Main River near the city centre. This involved:

- recycling derelict land (the projects "T.-Stern-Quay" and "Stadtviertel Alter Schlachthof");
- development of under-used land (projects "Kaiserlei" and the area of the southeast end of Frankfurt am Main); and
- general upgrading of the waterfront by developing a new green wedge along the Main River.

In this connection, "Stadtviertel Alter Schlachthof" is one of the important land reuse projects in Frankfurt am Main today and will be the first completed redevelopment on the banks of the Main River.

THE SLAUGHTERHOUSE PROJECT ("STADTVIERTEL ALTER SCHLACHTHOF")

This new neighbourhood was planned for an area that, since the 19th century, has been the location of the Frankfurt slaughterhouse. In the 1980s, the municipal slaughterhouse company built a new, smaller facility on site but had no firm plan for the old one.

In 1989, the housing shortage motivated the city to plan to redevelop the old slaughterhouse site; one-third of the new development would be business and commercial and the rest residential.

In 1990, the local planning authority arranged a planning and architectural competition for the whole slaughterhouse site, which covered 120,000 square metres (30 acres). The following year, the city decided to develop it as a new, predominantly residential, area, on the basis of the winning architectural plan. The new slaughterhouse will be relocated to an outer suburb in 1994.

ARCHITECTURAL LAYOUT

The architectural layout is characterized by three essential elements. First, there is the traditional block, its individual lots consistent with the adjoining neighbourhood and with European town-planning traditions at the turn of the century. There will be a distinct separation between public and private zones.

Second, low-rise apartment buildings will be at a desirable location on the Main River bank, inside the future green wedge there. The third element is the careful siting of two special structures: a tower and an public space.

They will mark a new central place in the city and will accommodate public and commercial facilities.

This new neighbourhood will create 140,000 square metres (1,506,997. square feet) of residential space and about 70,000 square metres (753,498 square feet) of commercial and business space. It provides for some 1,500 flats for about 3,750 inhabitants and approximately 1,800 new jobs.

DEVELOPMENT STRATEGY/PUBLIC-PRIVATE PARTNERSHIP

To implement development of the old slaughterhouse area, the city government created a co-operative partnership among the local administration, a private developer, and investors; in 1992, the Mainufer Project Development Company was founded. Assisted by a municipal building company, it is responsible for managing the development plan, civil engineering, decontaminating soil, creating and converting streets and green areas, as well as development parcel sales and financial administration. The management of all planning procedures and development and planning control is led by the planning authority. Representatives of all development partners were members of a development working group.

LOCAL MANAGEMENT OF CONTAMINATED SOIL

During the initial planning stage, there was concern about potentially contaminated soil because the site had been used for industry for nearly a century. Historical land-use research revealed that it is located on a former marsh of the Main River that, in the last century, was landfilled to provide a location for the old slaughterhouse. The source and quality of the landfill material were unknown.

The historical land-use research included:

- evaluating historical lot plans and interpreting old maps and aerial photos to identify the former locations of the different industries;
- investigating the former production processes of those industries; and
- using that information to establish so-called “hot spots” of suspected contamination.

On this basis, a first assessment was made by the local environment authority. Rough analyses showed a general inorganic contamination (heavy metals) of landfill material and particular contamination with organic chemicals because of the industrial use. This meant reexamining the feasibility of a new housing estate in the area.

At the request of the planning authority, a working group was created to address the problems associated with the contaminated land. It was established by members of the local environment and planning authority, the development company, an environmental engineering agency, and the regional government; the latter has legal responsibility for contaminated land if it represents a threat to public health.

Further soil sampling and analyses in connection with the development and building plan and approvals process were necessary to identify the exact nature of the contamination, its pathways, and the potential risk it might pose. Testing requirements differ, depending on the intended use of land, whether as residential, green areas or as sealed streets and squares.

There are no obligatory standards in Germany's environment code regarding contaminated land. Normally, environmental authorities apply the threshold values for levels of contamination in soil and ground water developed in the Netherlands, commonly referred to as the "Dutch list".

In Germany, liability for contaminated land rests first with the polluter, then with the landowner. Often, however, the polluter cannot be found and the landowner cannot afford to decontaminate the land; therefore, a remediation fund is being developed, using fees charged for dumping refuse at sanitary landfill sites. Generally, in remediating and redeveloping contaminated sites, the city buys land and subsidizes redevelopment, at a cost of about \$150 per square metre.

Extensive drill core soil testing established the actual contamination and allowed an assessment of the risk potential for future users of the area. It was decided that reuse for a new housing estate is possible and economically viable. Excavation of the area was permitted and, because excavation would not threaten public health, the local environmental authority was given responsibility for it. The decision making process for the Frankfurt project is shown in the chart on page 14.

But there are problems to be overcome. The first is that a number of small areas are contaminated with organic chemicals (including polycyclic aromatic hydrocarbons and chlorinated hydrocarbons). At the moment, appropriate strategies for decontaminating these soils, including thermal treatment, are being explored.

The second problem is wide-spread, low-level heavy metal contamination of the old landfill material. Use of this type of contaminated soil has to be licensed by the local and regional environment authorities. At the moment, the working group on contaminated soil is trying to find appropriate uses for it — perhaps as covering of the local refuse disposal site or as sub-material for road construction. To guarantee utilization of

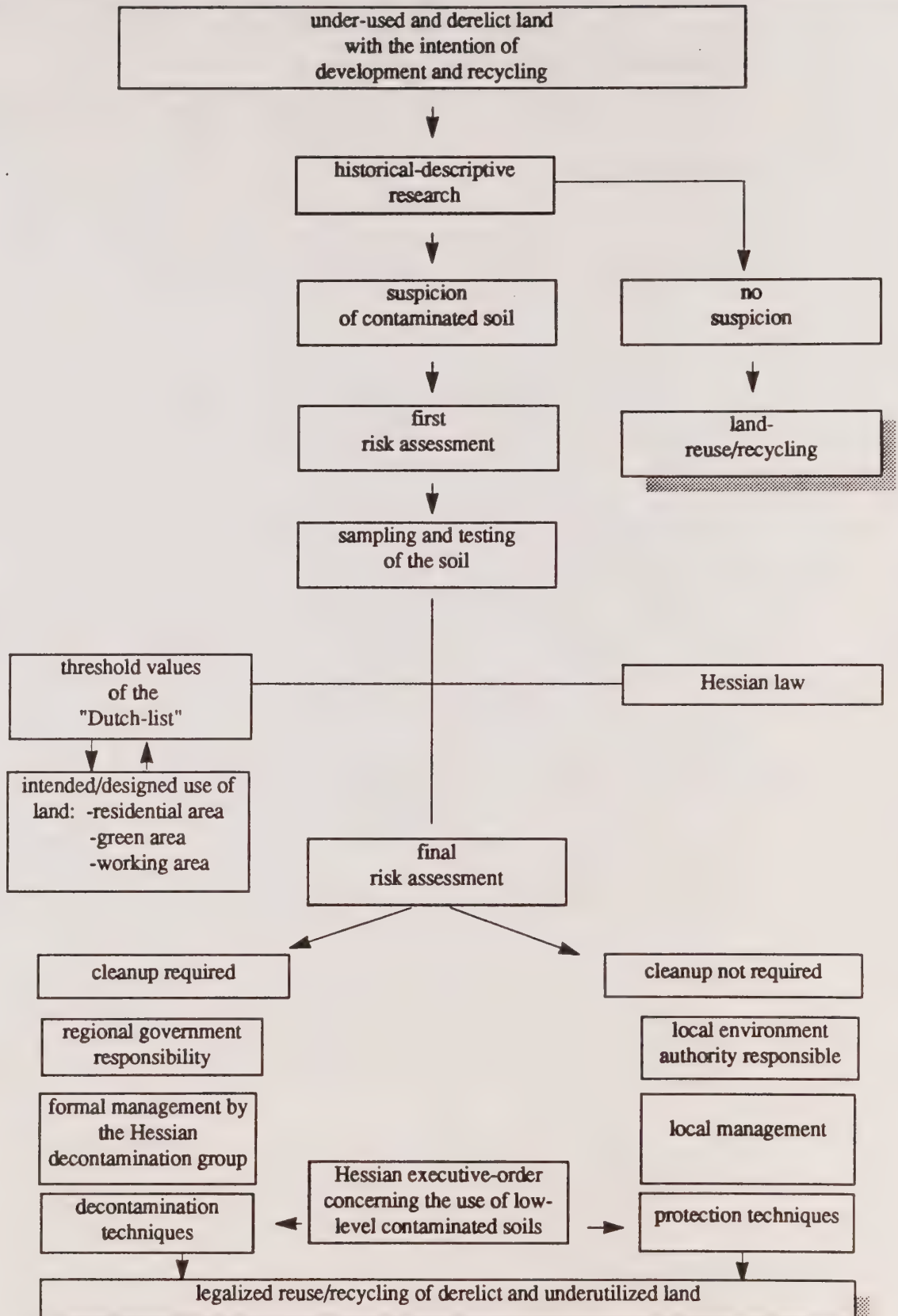
the green areas planned for the site, without risking human health or the environment, a covering of clean soil will be laid to a depth of one metre (one yard). The excavation will start this year and construction of the buildings is projected to begin in 1994.

The efforts of the working group have resulted in the conclusion that the proposed new housing estate can be achieved with environmental and economic benefits.

LOCAL MANAGEMENT OF CONTAMINATED SOIL IN FRANKFURT AM MAIN

development - and building - plan process

building permit process



CASE STUDY 1.2: THE GERMAN EXPERIENCE

*Gerhard Seltmann and Colleen Schmitz
International Building Exhibition Emscher Park (IBA)
Gelsenkirchen*

The City of Bottrop

This project operates under the principle that urban and ecological change must be made together.

The State of Nordrhein-Westfalen has 17 million inhabitants and includes Cologne, the largest urban area, and Bonn, the capital of the former West Germany. The Rhur region, with a population of 4.4 million, is the state's old central industrial region. Since the 1960s, it has undergone major structural economic changes: there have been four coal crises since 1966, as well as three crises in steel production. Over this period, the region has lost and gained some 300,000 jobs; it had no university until the 1960s, while there are now 150,000 students, new industries, and new jobs.

At present, the region's prosperity is average for the country but is unevenly distributed: its south is prosperous while its north is not. In 1989, the state government began a program of urban and ecological development in the north, recognizing that the economic future depends on urban and ecological quality. The government asked towns, cities, enterprises, and unions to participate in joint decision-making through a commission.

THE COAL MINE AND COKE PLANT SITE

The north Rhur region has a population of 2.2 million people, and is 800 square kilometres (309 square miles) in size. The City of Bottrop, which has a population of 100,000, grew rapidly around a mining and industrial area. In the 1980s, a major coal mine in the middle of the city was closed and demolished but no plan had been created to deal with the 22 hectare (54 acre) site. In 1989, the city started to develop a ten-year plan with the mine owners and potential investors.

The first step was to research the level of contamination at the site: mining operations had not caused contamination, but working with the coal and the coking process had. Contaminants on that part of the site could not be excavated and hauled away for landfill or incineration because of public opposition to locating landfill and incineration facilities. Because there was loam under the contaminated soil, and no groundwater pollution, the solution was to isolate the site and contain and cover the contaminated soil. This part of the site is only six hectares (15 acres) and is now a park on which there can be no building. The remainder of the 22 hectares (54 acres) includes new housing, commercial activities, and government buildings.

All the investors, the city, and the state were involved in the development process, in a multi-party contract. The state provided funding for infrastructure and, in order to reduce costs, the development was carried out as one step, rather than in phases.

STEEL, COAL, AND COKE SITE

Another project in Bottrop involved a 200 hectares (494 acres) site, formerly used for industry, which had contained a coal mine, steel mill, and coke plant; the facilities closed in 1985.

Primary consideration was given to developing the site as a park — there is not much green space near housing in the northern Rhur region — but the old steel mill, with blast furnaces and buildings, was contaminated.

The first step was to establish the type of contamination. Some areas were free of contamination and were developed as parkland first; there were local pockets of contamination in others, including a slag hill. These were covered and will be used as parkland by 1994. Still others have a combination of contaminants and it is not yet clear how problems will be resolved: besides technology, there are also questions of politics and financing. While responsibility for these sites is still unclear, the rest of the project will proceed, safe areas being opened first and others dealt with step by step. It is possible that solutions will be found in about five years and financing in eight years.

The old buildings and blast furnaces presented unique problems: demolition of the blast furnaces would be very costly and it is unlikely they could be converted to a different use.

The company that had owned the furnaces said it would cost DM500,000 (Can\$385,000) to ensure that the buildings and furnaces were secure. They could then be used as a living industrial museum and earn DM70,000 (Can\$53,900) annually in admission fees.

The City agreed to this plan to preserve the site as a museum for 20 years; now, there is a walk through the blast furnaces and rock climbers practise by scaling the building walls. One of the old buildings will be converted to a concert hall.

CONCLUSIONS

There are currently 82 remediation projects in the Ruhr region. There is a need to think of development, not in isolation, but by co-ordinating and moderating various interests. It is important to work on all projects with a shared understanding among interests. Germany is now in an economic crisis and there is a risk of being seduced into fast decision-making that can result in the wrong decisions. It is therefore important to draw on our experience and to recognize the importance of combining environmental and economic regeneration.

Case Study 2: Tacoma, Washington

2.1 The Thea Foss Waterway: An Overview
presented by Karen Larkin,
City of Tacoma Public Works Department

**2.2 A Comparison of the Washington State and
Ontario Regulatory Frameworks**
presented by Brad Jones,
Gordon, Thomas, Honeywell, Malanca, Peterson and
Daheim

2.3 Application of Site Remediation Technologies
presented by Bruce McDonald,
B and V Waste Science and Technology Corporation

2.4 A Comparison of Tacoma and Toronto
presented by Tim C. Thompson,
Gordon, Thomas, Honeywell, Malanca, Peterson and
Daheim

CASE STUDY 2.1: TACOMA, WASHINGTON

*Karen Larkin
City of Tacoma Public Works Department*

The Thea Foss Waterway: An Overview

Tacoma is located on Commencement Bay of Puget Sound, approximately 48 kilometres (28 miles) south of Seattle. The United States Environmental Protection Agency has designated Puget Sound as an estuary of national significance. Commencement Bay is a large deep-water inlet in the Sound's southerly portion.

The Thea Foss Waterway flows into the Bay, in close proximity to the central business district (CBD), Union Station, Tacoma Dome, and the Port Industrial Area. It has a shoreline of approximately 5.6 kilometres (3 miles) and is separated from the CBD by railroad tracks and a freeway.

Early industrial activity on the Tacoma waterfront left contamination problems; in 1981, along with other Commencement Bay sites, the Foss Waterway was placed on the interim national priority list of the top 115 hazardous waste sites in the United States. In 1983 the national priority list removed the deep-water area because water quality studies showed minimal contamination there; the near-shore area remained on the list. The city was identified as a potentially responsible party (PRP) and is now involved as a landowner.

The potential clean-up cost was so high that it seemed unlikely anything would happen with these properties for the foreseeable future. Investors and banks are reluctant — if not totally unwilling — to lend money as security when land is contaminated. Even a release of lender liability leaves them worried that default will saddle them with a contaminated and virtually worthless property.

The City's vision for the waterway could be achieved only if the city took action. In 1992, City Council, in co-operation with Metropolitan Parks, voted to purchase a significant number of parcels on the waterway, totalling 11 hectares (27 acres) and it is still in the process of purchasing

additional parcels. The City now owns most of the land on the west (downtown) side of the waterway and a small piece on the east side. It could control development of these parcels and drive the clean-up effort for the waterway.

In 1991, the City began preparation of the Foss development plan, which is to explore various options for land uses, establish guidelines for new development (both public and private), promote public access and enjoyment of the shoreline, and provide a strong connection to the CBD. The City held a series of public meetings and published a newsletter during the planning process.

Just as the City was publishing its Foss development plan, the Executive Council of local business leaders came out with a vision of its own; the city could have done a better job of co-ordinating the two. While there were consistencies between them, there were also marked differences, a major one being that the Executive Council's plan did not include any existing industries on the east side. These businesses, of course, were very concerned and efforts are now being made to meld the two plans.

The current task is to develop an environmental master plan (EMP) for the waterway; it will deal with requirements of both federal and state agencies and will establish the framework for proceeding with clean-up activities, based on a waterway-wide approach, rather than one that is site by site. The consulting team assembled for the development of the EMP is unique in Tacoma's experience: the team comprises people with technological, scientific, and legal expertise, and others who assist in recommending funding proposals, work with state and federal agencies, and develop a public participation plan.

PUBLIC PARTICIPATION

Under the federal Superfund law, the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), requirements for public participation in environmental decision-making processes are minimal. All on-site actions are exempt from federal, state, and local requirements for permits. While there are many technical stipulations for obtaining a permit, there are no explicit requirements that a proponent go through a process that includes public advertising, notification, and public hearings.

CERCLA agreements for clean-up action are essentially negotiated behind closed doors; once the PRPs (potentially responsible parties) have reached tentative agreement with the regulatory agencies, the draft agreement is released for 30 days for public comment.

The EPA is trying to include more public involvement, including publication of fact sheets and a requirement that PRPs hold public meetings, but the process is still very closed.

To a far greater extent than is possible under CERCLA, the state's Model Toxics Control Act (MTCA) involves the public in clean-up decisions; it provides for public input at every stage of the process, from site identification to redevelopment design.

MTCA's more active approach to public participation comes from the fact that the law originated as an initiative by citizen and environmental groups concerned with — among other things — what they viewed as insufficient public involvement.

The Washington State Department Of Ecology must give public notice of an opportunity to comment on agreed orders, consent orders, enforcement orders, state reports, and clean-up decisions. Notices are published in a monthly "site register". If ten or more people request a public meeting, one must be held.

Public involvement in clean-up efforts poses two problems: first, negotiations between PRPs and the regulatory agencies is a confidential, legal process. Therefore, it is difficult, especially when the city is working jointly with private PRPs, to involve the public in this negotiation process.

Second, timing is difficult. If the public is involved early, people want answers, and expect to be informed about problems and solutions before such answers are possible. But if the public is involved later, solutions are proposed without adequate public input. It is a balancing act. Proponents should go to the public early with as much information as they have and invite them to comment.

CASE STUDY 2.2: TACOMA, WASHINGTON

*Brad Jones
Gordon, Thomas, Honeywell, Malanca,
Peterson and Daheim*

A Comparison of the Washington State and Ontario Regulatory Frameworks

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) is the relevant American federal law. The CERCLA process is characterized by a lack of responsiveness or flexibility, and strong incentives for front-end litigation. Under CERCLA, it took nine months in private negotiations with the EPA just to get an agreement to conduct sampling in the Commencement Bay area. Since 1981, \$20 million have been spent on consultants' fees on Commencement Bay issues — but nothing has actually yet been done. CERCLA has been called the lawyers' full employment act. As a practical matter, it relates to only about two to five percent of contaminated sites in Washington State.

MODEL TOXICS CONTROL ACT (MTCA)

In 1988, the business community and state government in Washington worked together to create and pass environmental legislation which was strongly opposed by environmentalists. Environmental groups used to advantage a state law that allows private citizens to have their own draft legislation put to a plebiscite if they obtain 150,000 signatures on a petition requesting one. In the plebiscite campaign, the business community outspent environmentalists ten-to-one on advertising, but the environmentalists' legislation received 70 percent of the vote. Thus the MTCA was created.

The MTCA is strong: fines up to \$25,000 per day can be imposed for failure to follow orders issued pursuant to the act. If a landowner does not clean up a site, the government can do so and bill twice what it would have cost the landowner; the government is then permitted to sue the landowner for three times its billed costs. This creates a very strong

incentive for voluntary clean-up. The law also casts a huge net for liability, including current owners and tenants without regard to fault, transporters of contaminated wastes, and lenders. Full costs for cleaning up can be allocated to any party involved. A chart comparing the MTCA and Ontario's 1989 Guidelines for Decommissioning and Cleanup of Sites follows on the next page.

There are three site clean-up approaches provided in the MTCA. The first, which is for residential and industrial land use, sets standards of maximum threshold contamination levels that cannot be exceeded. Under the second and third, risk assessment is used and site specific cleanup strategies are negotiated and institutional controls are put in place, including deed restrictions, as well as zoning and excavation restrictions. Capping of sites is allowed if the soil can be protected from disturbance. Lender liability creates an incentive for self-policing of contained sites.

A standard phase one site audit includes a historical land-use review, aerial photography, interviews with neighbouring landowners, and site walks. There is an "innocent landowner defense" under the act, covering the landowner who had no reason to know the land was contaminated. To prove this, a phase one audit must have been carried out.

Excavation and landfilling of contaminated soil is a very low priority. There is a lack of landfill sites in the State, and under the law, liability for material deposited in a landfill site stays with the depositor. This discourages landfill: fewer than 20 percent of petroleum-contaminated sites use landfilling, while 80 percent use bio-remediation techniques.

The focus of the law is on property ownership and standards are tied to land use. When future standards increase the level of clean-up required, there is future liability for landowners even in cases where they have cleaned up a site and received approval. The city has recognized concerns about the matter and is willing to assume liability on behalf of the Foss Waterway landowners, in exchange for the first nine metres (ten yards) of land adjoining the waterway, on which it will create a public esplanade.

Tacoma is also exploring innovative financing techniques. Because remediating a site adds value to the land, and property taxes are based on land values, there is the potential to use the incremental value added by the clean-up. Revenue bonds can be issued now to cover clean-up costs and be paid for directly from the property's increased tax base.

Washington's Model Toxics Control Act (MTCA)

Ontario's Guidelines for the Decommissioning and Cleanup of Sites in Ontario (1989)

1. Jurisdiction	Any release or threat of release of contaminants to the environment (including historic releases)	Releases of contaminants which have "adverse effects" (i.e. ongoing releases or offsite impacts); land use changes
2. Enforcement Authority	Unilateral Orders, Agreed Orders, Consent Decrees	Orders, land use approvals
3. Implementation Emphasis	Voluntary action (no oversight and limited reporting requirements)	Administrative action (high level of oversight, review and comment)
4. Liable parties	(1) Current owners and operators (w/o regard to fault); (2) past owners and operators who owned or operated the site at the time contaminants were released; (3) generators and transporters of contaminated materials released at the site; (4) persons who arranged for transport or disposal	(1) Current owners or occupiers; (2) persons who had charge, management or control of the source of contamination; (3) persons who cause or permit discharges
5. Cleanup Standards	Regulations: Method A Residential; Method A Industrial; Method B Risk Assessment; Method C Industrial Risk Assessment with Institutional Controls (e.g. deed restrictions)	Guidelines: Clean to background or clean to specified level for 22 constituents or propose site specific criteria (usually based on another jurisdiction's standards)
6. Cleanup Depths	Presumed to be 15 feet or interface with ground water	Lowest depth at which contaminants are present or bedrock

CASE STUDY 2.3: TACOMA, WASHINGTON

Bruce McDonald
B and V Waste Science and Technology Corporation

Application of Site Remediation Technologies

Some 100 organic compounds are covered under Model Toxics Control Act (MTCA) standards; by maximizing the transient use of a site, risk factors can be reduced. A risk-based mathematical formula is used in setting standards: the residential risk threshold standard limit is computed on the basis of a person with a mass of 60 kilograms (132 pounds), who eats 200 grams (one-half - pound) of soil per day for 70 years and, as a result, has one chance in one million of getting cancer.

Site redevelopment scenarios can change risks and, with them, the costs of remediation. It is usually better to plan remediation and redevelopment together; otherwise the assumption governing remediation will be the most sensitive land use and the highest standards in the United States will apply.

Widely accepted technologies are being evaluated for use in Tacoma including:

- bio-remediation;
- solidification;
- incineration; and
- containment.

The methods chosen will be the most cost-effective technologies appropriate for the future land use. In Tacoma, which has fairly widespread low-level contamination and a few hot spots, containment is the preferred approach for low level contamination and the hot spots are treated on site. Off-site disposal is ranked relatively low as a soil management option.

Containment necessitates imposing institutional controls that limit future uses of the land and groundwater, utilizing zoning and deed restrictions.

This approach helps the city to obtain agreements from the regulators allowing containment of low level-contamination and remediation of the worst hot spots.

It has been important to deal with the Thea Foss Waterway site on an area-wide basis, rather than parcel by parcel. This creates area-wide standard agreements and minimizes uncertainty for financial institutions and developers.

CASE STUDY 2.4: TACOMA, WASHINGTON

Tim C. Thompson
Director of Special Projects
Gordon, Thomas, Moneywell, Malanaca, Peterson and Daheim

A Comparison of Tacoma and Toronto

There are many obvious similarities between Tacoma and Toronto: both are urban areas with complex ecosystems that sustain a variety of fish and wildlife species, and both have ports. Both are interested in clean-up and ecosystem health; both see the need for public/private sector co-operation in redevelopment, as well as being concerned about balancing environmental and economic interests.

The United States has not been a shining beacon in this regard: in large part, the major legislative initiatives passed by the American Congress have failed. The jury is still out on the Washington State system: there have been relatively few major clean-ups, and even fewer clean-ups with integrated restoration activities. But billions of dollars have been spent. Businesses have added environmental consultants and attorneys to their staffs. One of the biggest costs of doing business for small and large business enterprises is related to clean-ups or obtaining environmental permits.

Nonetheless, there is little to show for strengthening many environmental laws. There are some improvements — but relatively few — and there must be more, if we are to create a balanced, workable, and measurable definition of “ecosystem health”.

THE ECOSYSTEM APPROACH

Tacoma, which has the luxury of focusing on a single but important body of water, defining it as an ecosystem and looking at it comprehensively, is examining how the Thea Foss Waterway relates to the larger Commencement Bay ecosystem.

Toronto’s definition of ecosystem is similar to Tacoma’s, but with one major difference: in Toronto, “ecosystem” includes humans and the

region's economic health; American environmentalists are adamant about not including economic health in the definition of ecosystem. Toronto's approach is much broader and will allow more flexibility.

The definition of the GTA Bioregion is also an improvement on Tacoma's system: Toronto's focus on an entire area is laudable. The current American debate regarding protection of the spotted owl and timber supply reflects the species-by-species approach being taken in the United States.

THE NEED FOR INTEGRATED EFFORTS

The American regulatory climate is often confusing, costly, and fragmented. In Toronto, one of the biggest challenges will be to develop integrated clean-up and redevelopment efforts in the face of jurisdictional fragmentation. That is also the situation in Tacoma, in dealing with the Thea Foss Waterway. The Tacoma strategy is to:

- create trust with regulatory agencies;
- emphasize partnerships with decision-making ability;
- use creative approaches, given that the status quo does not work;
- emphasize a win-win environment: ecological health and economic prosperity can go together.

Documentation of the experience in Toronto notes that resource agencies have a narrow focus and are not intersecting enough with agencies managing the economy. While this is very important, it is necessary, in regard to remediation and restoration, to first seek unanimous consent among resource agencies.

CONCLUSION

Tacoma and Toronto can become examples of a new approach to environmental protection, showing how protecting the environment can actually lead to economic growth: land that was once polluted and useless is now valuable; land in commercial areas that was once vacant now has shops, businesses, and parks. Tacoma is determined to show the world that environmental success equals economic success and that economic success equals environmental success.

All societies tend to paralyse themselves fighting over points of disagreement, rather than moving forward on issues where there is agreement. In the United States, it is going to be necessary to rewrite and amend the Superfund legislation in the next year and-a-half because it has

failed to clean up enough sites. This promises to involve a major debate, dealing with such significant issues as acceptable levels of risk, risk assessment, eliminating certain punitive actions, allowing more incentives for voluntary clean-up, and providing direct financial funding for major clean-ups.

While public/private partnerships will be crucial, it is necessary to assume collective responsibility. Cities and towns must lead the way by investing in infrastructure. It is time for cities to assume leadership and to provide answers to the planet's serious problems. Thinking must change, as we adapt to changes in values, technology, and public policy. If cities are to be successful, they must change thinking in both the public and private sectors and in national environmental protection. It is time to seize the opportunity and begin a new generation of environmental action.

Dian Cohen
Author of No Small Change

Building a Sustainable Society — A Problem in Economic Signalling

Toronto needs a waterfront that can be an example to other cities on the Great Lakes: if Toronto gets its waterfront act together, it can demonstrate what can be done.

The new economy: for the last ten years or so, its arrival has been forecast; now it is here. Among revolutionary aspects, it unhooks economic growth and employment. There can be some three to four percent growth in output while unemployment stays steady or even climbs a little. Generally, small companies can out-compete larger ones because they can focus more tightly and move faster.

The distinction between goods and services is eroding: services can now be stored, traded, transported, and sold like goods. Goods now are mainly composed of what used to be called services: design, marketing, financing, promotion. Work is also changing: the skill and ability of working people is a key ingredient in corporate success — not just labour power, but applied intelligence, experience, skill, and judgment. The quality movement is about empowering the worker, about letting each employee working on a product stop the line if the product is not being made correctly.

Companies compete on the varieties of tasks they can perform with a single workforce. Cross-training, flexibility, just-in-time, zero defect — these are the buzzwords of industry in an information age.

The next stage — flexible on-line, manufacture to order — will be even more impressive. As soon as the law allows, there will be so-called “virtual” companies, representing temporary alliances struck to capture one fleeting market, all co-ordinated by telecommunications: that is the reality production engineers are planning for us.

The new economy also brings some significant power shifts: it unhooks national, political boundaries from national economies. Although the most important political unit may be national, economies are likely to be trans-border, regional, and local. Retailers on both sides of the Canada-American border go head to head for the same Canadian shopper, and, increasingly, for the American shopper as well. Everyone can shop at a distance, not just for goods but for services, including education and specialized training.

The winner in these and other shifts is the individual with an idea and the determination to put it into action. Today's entrepreneur has more access to global markets, global financing, and information about markets and financing than ever before. The other power shifts are mainly consequences of the shift of power to the individual and the new choices that opens up.

What are some of the implications? The new economy turns the industrial city upside down: industry and manufacturing used to locate where land was cheapest and this continued as the industrial economy became more service-oriented and as factories moved from downtown to surrounding industrial parks. In the industrial-service economy, attracting the white-collar armies to the cities was an affair of tax abatements and special deals for developers. Today, however, the key variable is not land but information: the real guts of production will locate where information is cheapest.

It means that the great heartbeat motions of transferring huge armies of workers in and out of major metropolitan areas can now stop. The back offices that need armies of operators will move to more comfortable, smaller cities — for example, from New York to Atlanta, as they are now doing. The front offices will need to stay in touch with bankers and designers; those who can live downtown and work over the phone will live in the information cities. In an information economy, the information manipulators can live where they work and vice versa.

The great absurdity that Buckminster Fuller identified years ago — a modern city where millions of people commute in every day, spend the entire day on the telephone, and commute home again — ends with the arrival of the information economy and, with it, the need for huge Olympia and York-style office towers. Technology eliminates the need for all that, but technology is not the whole story. We have to think about funding, too.

The new economy poses a new funding challenge for cities. Today, the old property tax funding base is in collapse. The industrial cities attract a glut of people every day, requiring lots of services; the cost is so great that the taxes they require make it impossible for people to spend the night

downtown. Instead, they go to the suburbs; but now they can stay in the burbs, so-called “edge cities”, that are springing up as a reflection of the new work choices of an information economy.

As a result, the big American cities are in decline and those with smaller populations — in the 1.5-million to two-million population range — are becoming the locations of choice, provided they have the international flights, international presence, and links to the wider world that global operations require. Places like Seattle, Houston, San Francisco, and Atlanta all outrank New York, Chicago, and Boston as cities of choice among leading American businesspeople.

THE WORK OF THE WATERFRONT REGENERATION TRUST

The ecosystem approach is working, because it’s fundamentally a communication system: it looks at a particular piece of the universe that’s running in perverse directions, establishes clear guidelines, and creates virtuous circles where there were only vicious ones before.

That is the way anyone at all concerned about how the environment and the economy work together believes it can be made to happen. If it can be shown to work in Toronto, then why not Canada, and maybe even globally?

Enlarging the ecosystem approach is going to be a difficult problem: there are limits to the number of things you can negotiate. It’s one thing (and it’s no small thing) to get a relatively small group of interests to work together explicitly. It’s a problem of a totally different order to get more complex groups of competing interests to arrive at explicit agreements about goals and guidelines: at some point the time and effort cost more than the parties can bear.

Another problem may be the assumption that there are “big interests” sufficiently representative or commanding to deliver on undertakings. In our increasingly fragmented world, that’s a big assumption. Indeed, the whole thrust of technological change we’re undergoing is to empower ordinary individuals, rather than big companies, big governments, and big associations.

There’s also a basic problem in the assumption that the common interest is the same as the sum of the individual interests — what is known in economics as the “fallacy of composition”: assuming that the whole is the sum of its parts. Good consultations don’t hurt. They may even be necessary. But they aren’t enough. If we put all our eggs in that basket, we’ll be disappointed, as, indeed, many were after Charlottetown and after the Prosperity Initiative.

The response to these shortcomings must not be to do more of the same but to try making more creative use of the marketplace. The usual answer to the question "Can markets work for environmental problems?" is "No".

A widely held view is that ordinary competitive markets don't work to resolve environmental differences between a polluter and society, because the incentives are all wrong: the environment is a giant "common" that becomes a dumping ground because it is "free" to individuals.

Because markets don't work, we need regulation. Regulation comes along to "close" the commons, impose fines, etc., and use "command and control" edicts to ensure that certain types of solutions are approved, instead of others.

Because there are probably limits to the quest for regulatory solutions, there is a need to revisit the old analysis of markets and the flaws in the argument that markets can't work. For example, there is the assumption that regulation is an alternative to markets, that markets work efficiently when they are regulated properly. Examples include competition policy, anti-trust, product standards, regulatory weights and measures, etc. We have consumer and other market legislation to ensure that choices are informed.

Think of markets as little information systems: buyers and sellers exchange information in which prices are the most efficient (most cost-effective) signalling devices. When price and value are right and the product is available at a point of sale, it is sold.

Markets are about signalling, and about processing those signals to produce the goods and services that consumers want to buy. We have just come through the biggest signals failure in human history. From the late '60s through the recession of 1981-82, commodity prices rose, wage and price controls were imposed, and there was a breakdown of short-term and long-term signals. Because of that breakdown, and our under-rating of short-term disequilibrium, there were unbelievably harmful consequences:

- the end of fixed exchange rates;
- short-term interest rates that went higher than long-term rates;
- a ten-fold increase in the price of gold;
- waves of bank failures;
- Third World borrowing/not repaying, the outflow from poor to rich;

- short-sighted environment practices; and
- no long-term capital markets.

The situation is now more or less solved: long-term capital markets are now back; information technology has created new instruments to encourage environmentally benign behaviour (for example, debt-for-nature swaps, in which the tax-rate differential for environmentally improved land can be used to repay money borrowed for environmental improvements).

CONCLUSIONS

Trying to establish the sustainable city in Canada involves two big problems: the tax system, and the need to mobilize markets for local projects.

Cities are the wealth producers, but other jurisdictions make the tax decisions. Result: the returns to the city are a residual for which it has to compete with every other city. If cities got first cut at tax revenues, and allocated what was left to the other jurisdictions, the problem would be solved.

What is Toronto's power in the marketplace to promote long-run rationality? Canadian borrowing rules at the municipal level are very restrictive; there is basically no market in tax-free municipal bonds. Therefore, cities can't take advantage of the new flexibility that today's capital markets offer in funding local environment projects, even if those projects have substantial, measurable long-term benefits.

The upshot is that global, long-run sensitive capital markets will be very effective in encouraging sound environmental behaviour on the part of the private sector. They are allies in what cities are trying to achieve.

Environmental groups ought to encourage efficient capital markets. Gaining access to global capital markets and using that access to promote good long-run behaviour is crucial to ensuring we make the adjustments to more sustainability in a timely way.

More generally, bringing capital markets into the regeneration process is fully consistent with reinforcing the signalling process between short-and long-run rationality.

If Toronto in particular, or Great Lakes communities in general, could approach long-term capital markets advantageously, the Trust's success would become a demonstration of what imagination and persistence can achieve. A lot of ink has been spilt discussing our national competitiveness. The comparative advantage of having North America's most attractive cities could help us regain our competitive edge.

The new information economy offers cities a way forward without following the same gloomy path that confronts New York and other great American cities. But charm and civility will not be enough: the primary responsibility for allocating tax revenues must be moved to where the primary earning power is located: the cities of Canada.

Case Study 3: Vancouver, British Columbia

3.1 Pacific Place

presented by Bill Mottershead, British Columbia Ministry of
Environment, Lands and Parks

3.2 Coal Harbour

Rob McLenehan, British Columbia Ministry of
Environment, Lands and Park

CASE STUDY 3.1: VANCOUVER, BRITISH COLUMBIA

Bill Mottershead
Project Manager, Pacific Place
British Columbia Ministry of Environment, Lands and Parks

Pacific Place

Without doubt, Pacific Place is one of the best known blocks of urban real estate in North America — and one of the least understood. This apparent contradiction caused most of the problems during the early stages of the remediation project.

British Columbia's experience has been that referring to contaminated sites as "contaminated" immediately creates a worse perception of a problem than is often warranted. For example, if contaminants are found on a small part of a particular site, the entire site is labelled as contaminated; instead, these are now referred to as "troubled areas".

What people thought they were seeing was not necessarily what was there and much of what people thought they understood had very little to do with Pacific Place. As a result, a property that, in most respects, is a normal industrial site became regarded as the real estate equivalent of a pariah.

There were several reasons why this happened, but the main one was a series of rather sensational news reports in the early part of 1991, which created the false impression of a site contaminated consistently from end to end.

The term "Expo Land" became synonymous with "bad" and no one was interested in the results of studies and testing, carried out at a cost of about \$4 million. And certainly no one was keen to take any of the two million cubic metres (2,615,800 cubic yards) of surplus soil slated for removal during the site development.

The task was to explain actual conditions at the site, at a time when no one wanted to listen: it didn't matter that only five percent of the soil to be excavated contained wastes and special wastes. When attempts were made to reuse the other 95 percent elsewhere, the message was a loud and

sometimes shrill "Not In My Back Yard". Improved communications with the public were vital if the project was to proceed at a good pace.

There have been recent signs of success in overcoming the difficulties, but much more remains to be done and ghosts of the early stigma remain.

SCOPE OF THE PROJECT

Pacific Place is a strip of waterfront land on the north shore of False Creek, extending from the Cambie Street Bridge to Science World.

At 82 hectares (203 acres), Pacific Place accounts for one-sixth of downtown Vancouver. Remediating or restoring it to the point at which it can once more be used for residential purposes is one of the biggest and most exciting projects of its type in North America. When the work is completed, Pacific Place will be home to 13,500 people, an entire new inner-city suburb.

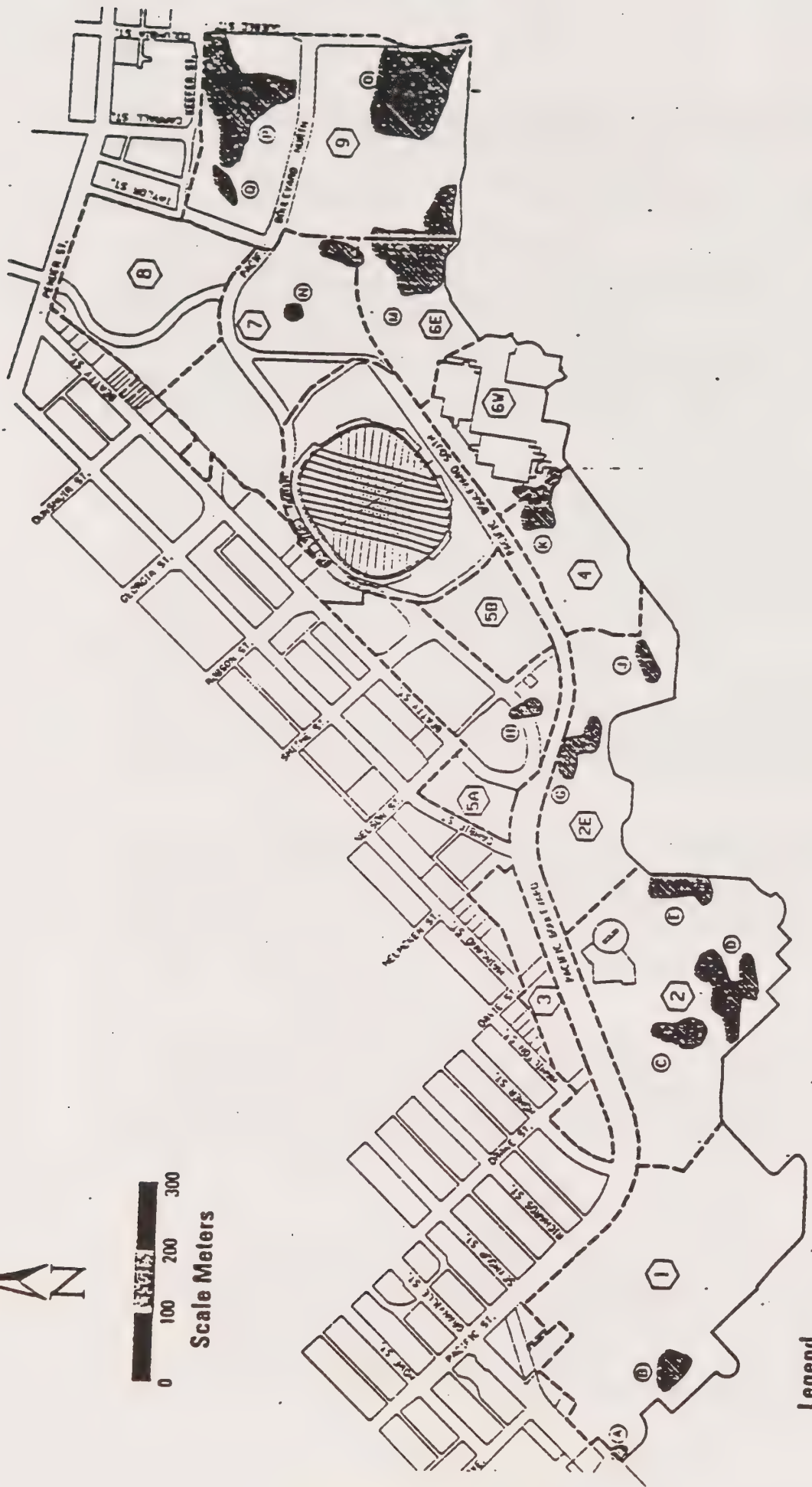
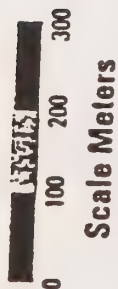
Three of the best known city landmarks are on or near the site: the old Canadian Pacific Railway (CPR) roundhouse, BC Place Stadium, and the Plaza of Nations. Eventually, these will be joined by 41 high-rise buildings, parks, marinas, and pedestrian and cycle paths along the seawall. Part of the northern end of the property is destined to become the new home of the Vancouver Canucks hockey team.

Normally, British Columbia Environment's only involvement in projects like this is to ensure that the site meets the stringent human health and environment standards set for residential use. In this instance, however, the Province is the former owner of the land, which was acquired for the Expo '86 World's Fair. As part of its sales agreement with Concord Developments Ltd., the Province has the responsibility for carrying out remediation.



For ease of remediation and development, Pacific Place was divided into nine land parcels (see map, page 39). Four of them — parcels 2, 3, 8, and 9 — were given priority for development and were covered by individual remedial plans. The balance of the site — parcels 1, 4, 5, 6, and 7 — come under a remedial plan made public in March, 1993.

Remediation work has now been completed and construction is well advanced on parcels 3 and 8, and the northern half of the original parcel 9, which is being developed as Andy Livingstone Park. Attention has turned to parcel 2 and to the portion of parcel 7 that will be the site of the arena and convention centre being developed for the Vancouver Canucks by North West Sports.

The Province anticipates that remediation of the remaining parcels will take approximately five more years. However, because remediation and



Legend

-  Areas of Hazardous Waste
-  Parcel Number

development go hand-in-hand, the owners' development schedules will determine the overall remediation schedule.

THE HISTORY OF PACIFIC PLACE

In the last 100 years, there have been many changes along False Creek's northern shoreline, mainly because of the area's early role as the city's industrial heart. The hunger for waterfront property during the late 1800s and most of this century was so great that about two-thirds of the present-day lands at Pacific Place are the result of landfilling in False Creek. In fact, landfilling there did not stop until just before Expo '86, which gave the site international prominence.

The landfilling, coupled with wastes left behind by the early industries, is responsible for most of the problem soils in Pacific Place.

The first heavy industry in the area was the Canadian Pacific Railway, which was granted 186 hectares (460 acres) in 1885. Scores of other enterprises sprang up nearby, seeking to take advantage of the railroad network. By 1928, the various industrial activities had taken their toll and False Creek was described as an "eyesore and menace to health".

Eight rubbish dumps occupied 15 percent of the shoreline and included among their neighbours 11 sawmills, 16 sewage outfalls, various wood treatment plants, metal works, painting and varnishing shops, and two gasworks.

The biggest contributors to small pockets of waste soils were the gasworks. The British Columbia Electric Railway's (BCER) coal-fired plant at the northeastern end of the site supplied the Gastown area with lighting and heating. The oil-fired Pintsch Gas Plant between the old CPR roundhouse and the shoreline probably produced the gas used to light early railway cars.

Both plants left an unfortunate legacy of waste oils and tars in the ground. A special containment program has isolated those around the BCER facility; the most volatile of the Pintsch Plant's residues are now being removed for treatment to clear the way for normal building construction near the roundhouse.

INTEREST IN THE PACIFIC PLACE PROJECT

Interest in remediating Pacific Place is enormous, with enquires coming from as far away as Perth, Western Australia, where a similar project is under way, involving an old gasworks site on the banks of the Swan River. Hardly a day goes by without calls from people wanting to use Pacific Place as the pattern for other projects.

In terms of worker health and safety, British Columbia Environment is moving into areas not now covered by the Workers' Compensation Board. It has had to develop its own standards, drawing from a world-wide pool of experience and expertise.

Similarly, the Ministry has had to develop soil and ground water standards, which, in some quarters, are regarded as too strict. However, it stands behind them: the Pacific Place standards are based on the best information available in North America and Europe, particularly that contained in the so-called "Dutch list". They now contribute to emerging provincial and national regulations concerning soil handling and remediation. Because the project has attracted so much outside attention, there is a special need to "do it right".

In the case of the excavation of special wastes on parcel 2, near the roundhouse, the Ministry has been accused of "overkill" and unnecessary expenditure on a problem that has been blown out of proportion. While it is gratifying to be considered too careful in matters of human health and environmental protection, the Ministry believes the expenditure involved is justified and will mean future cost savings.

It is important to remember that the parcel 2 operation is the first in which special wastes have been excavated from the site for other than testing purposes. Moreover, there are many people and organizations looking to the project team to provide the lead and set a pattern they can follow.

Therefore, the Ministry is trying to ensure that everything practical is being done to make the operation a success, establishing only good patterns. If all the bases are covered this time, the team will learn whether some measures are unnecessary, and make even better-informed decisions affecting other parcels.

PUBLIC COMMUNICATIONS

From the outset of the project, the Ministry was determined to maintain open lines of communication with the public. However, this very openness may have contributed to early problems of public perception, because there were two distinct audiences: the general public and the scientific community. These reacted differently to the use of the word "contaminated".

A technician able to detect several parts per million or billion of a substance in the soil considered those soils contaminated, but the contaminants were not necessarily a cause for concern.

The average member of the public, however, became alarmed. Contaminated meant "toxic", which, in fact, lies at the upper end of the

recording scale.

Coupled with sensational media reports, this encouraged a climate in which the public found it difficult to trust the Ministry and accept assurances that surplus soil leaving the site was safe for reuse in residential or industrial applications. Matters were not made easier by the fact that remediation started at the time of a build-up to provincial elections, in which it was possible Pacific Place would become an issue.

Site tours were organized for representatives of municipalities, environmental companies, and educational institutions. The project's library was opened to the public and briefing sessions were held with key groups; as well, opportunities were sought to address environmental conferences and study groups.

The public audience was more difficult than the technical audiences, particularly because many of the news media were not interested in "good news" about the site. However, briefing sessions were held with media organizations prepared to listen and several fair and constructive reports followed.

Direct appeals were then made to environmental groups and members of the public to attend open houses and site tours. A public meeting was held in Richmond, the destination of some of the earliest soil shipments, and a public meeting was held with the city's elected officials.

When soil was moved to Maple Ridge a public meeting was held with the district's mayor and council. A project team member was also on hand at the soil-receiving area to talk to members of the public and to news media.

A series of newsletters and fact sheets was created; the newsletters were mailed to municipalities, interest groups, and about 1,300 people living near False Creek and concerned enough to attend meetings called by the City of Vancouver to deal with other issues. The newsletters were also distributed to libraries, the news media, the Vancouver School Board, the Vancouver Parks Board, and the Greater Vancouver Regional District.

A "hot line" was set up at the project office and, in its early days, received about 50 calls daily from members of the public, most of them residents of Richmond. These were answered directly by either the project manager or the communications officer, and support material was mailed to callers.

An attempt was also made to set up a liaison committee drawn from interested members of the public and special interest groups, but it did not proceed: most parties said they had neither the time nor the personnel to contribute on a regular basis. Instead, they opted for regular telephone

contact with the project manager or communications officer and asked to be included on the mailing list.

The steady information flow has been maintained as much as possible since the start of remedial work in April 1991. The result has been a better appreciation of the nature of Pacific Place, although occasional blips come as reminders that the early stigma hasn't been erased.

Princeton offers an example. In October 1992, a proposal was made to use about 5,000 cubic metres (6,540 cubic yards) of industrial grade soil from Pacific Place to help remediate a copper mine tailings area near the town. A single negative and inaccurate report by a newspaper columnist created a public outcry and the plan was scrapped.

The soil rejected by Princeton was later used by the City of Vancouver for its new fire service training school, without public opposition. News media reports identified the soil as that rejected by Princeton, but this time the journalists were fair and balanced in their coverage.

Later still, the use of 50,000 cubic metres (6,540 cubic yards) of industrial grade soil from Pacific Place was accepted for a highway construction project in Langley. Again, the news media questioned the move, but were balanced in their reporting.

When the announcement was made that the first-ever excavation of special wastes for other than testing purposes was about to begin, the Ministry contacted all major media outlets in Vancouver, as well as several community newspapers serving the False Creek area. Initially, only the daily newspaper responded, with an article accusing the project of overkill in its safety measures; later, three community newspapers prepared articles.

Although ads were taken in newspapers, encouraging members of the public to telephone the project office to voice concerns or seek further information, only two calls were received in the first week. One caller was concerned about the fate of geese nesting near the proposed excavation, and the other wanted to know how the special waste soils would be treated.

All in all, it was a far cry from the early days.

SOIL STANDARDS

Because existing soil quality regulations were not comprehensive enough to use in evaluating and managing the diversity of residues found at Pacific Place, a new set was devised for the project.

British Columbia Environment and its advisors studied the most advanced environmental protection requirements in North America and

Europe, and consulted with public health and environmental experts. As a result, a set of tables was established, listing more than 100 chemical substances. They outline the concentrations and types of chemicals that, if present in the soil, will require assessment and possible remediation of a site.

Based on the assessment and chemical analysis, soils are classified in several categories. These are often compared to a ladder with five rungs: the bottom one is labelled A and the others are B, C, Waste, and Special Waste.

Soil assessed up to Level A contains no measurable quantities of foreign substances and is, to all intents and purposes, pure. Soil up to level B contains trace amounts of substances, but is considered suitable for residential use. Soil between levels B and C contains more of these substances and is limited to industrial uses. None of these require disposal permits. The industrial soils are limited to industrial applications, but there are no other restrictions.

The Waste and Special Wastes categories are subject to regulation and strict controls. They cannot be used for residential or industrial applications without being suitably treated.

SOIL AT PACIFIC PLACE

Two million cubic metres (2,615,800 cubic yards) of surplus soils will be excavated during the development of Pacific Place, an amount sufficient to fill BC Place Stadium to the rim twice.

Most of the soil will be displaced by excavations for high-rise buildings with deep foundations and several levels of underground parking. More soil will become surplus during road construction, when utility trenches are dug, and in the course of related activities. Of the two million cubic metres (2,615,800 cubic yards):

- 85 percent is residential quality;
- ten percent is industrial;
- three percent is Waste Soil; and
- two percent or less is Special Waste.

There are Special Waste soils on the site that will not be removed. Treating them will cost from \$150 to \$1,000 per tonne (one long ton). Some of the Special Waste will be contained in the barrier wall and liner cap on parcel 9, which will later be turned into a park. Other pockets lie more than nine metres (ten yards) deep and are effectively isolated from users of the site.

CASE STUDY 3.2: VANCOUVER, BRITISH COLUMBIA

Rob McLenehan

*Regulatory Co-ordinator, Coal Harbour Development Project
British Columbia Ministry of Environment, Lands and Parks*

Coal Harbour

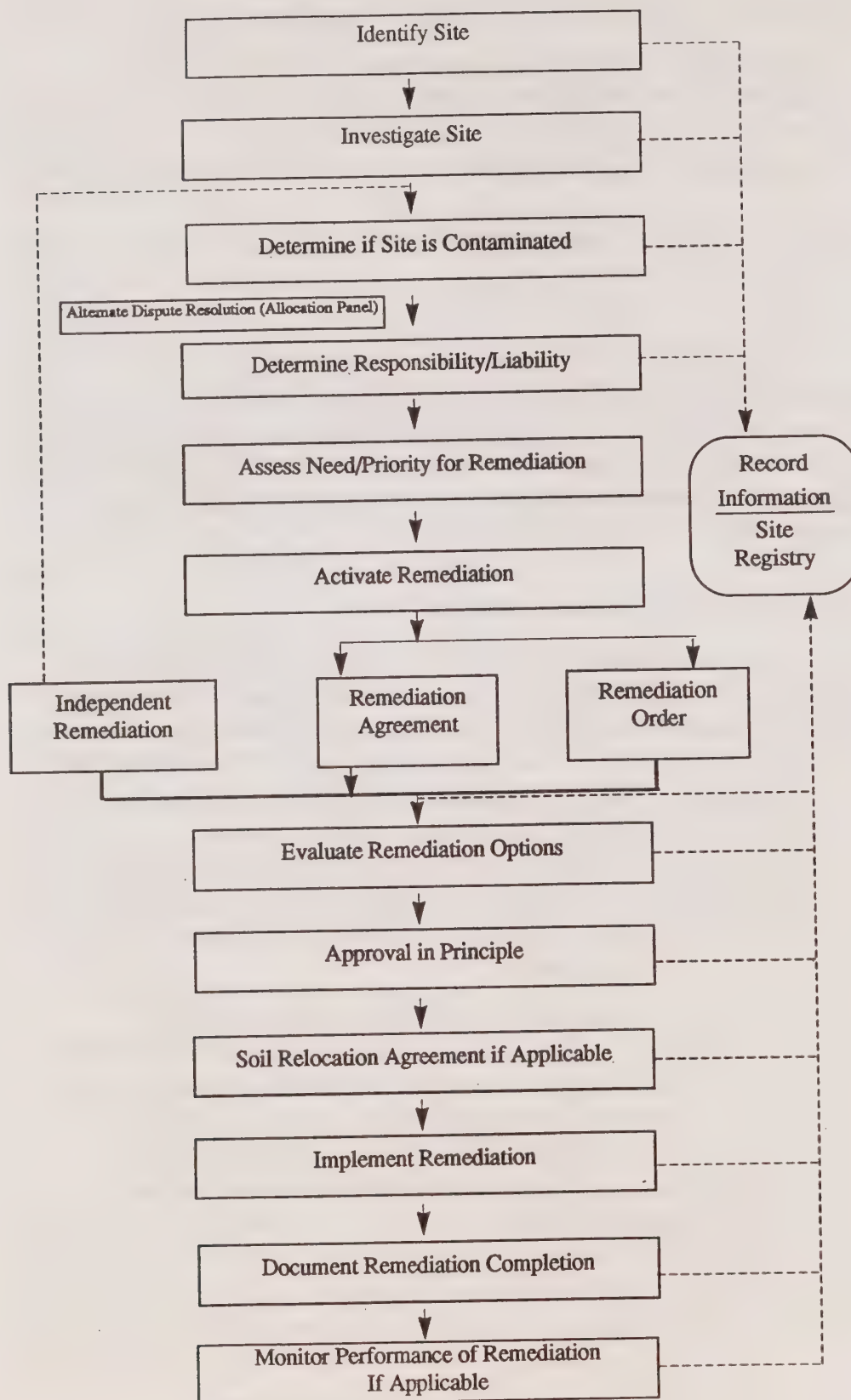
In May 1993, British Columbia introduced new legislation, the Waste Management Amendment Act, based on experiences in British Columbia, Oregon, and Washington. The main objective is to clarify responsibilities and liabilities. The generalized regulation/management scheme is shown on the next page.

THE NEW BRITISH COLUMBIA LEGISLATION

The polluter pay principle has been followed in the new legislation. The act outlines the investigative process, responsibilities, and liabilities, the remediation implementation process, and closure documentation. It establishes joint, several, and retroactive liability (if standards change in the future). There is a formal mechanism for establishing site remediation agreements and remediation can be ordered. Formal closure documentation includes a certificate of compliance if the concentration approach was used, and a conditional certificate if the risk assessment approach was used. The government retains the right to reopen a case and will do so if the land use changes.

The British Columbia Ministry of Environment, Lands and Parks recommends phased investigations, establishing a site profile and history. Then there are two possible approaches: generic concentration and site-specific. The first uses the list, developed by the Dutch, of acceptable concentrations of different contaminants, but recommends specific analytical methods to be used. The soil must be cleaned to meet the standards or hauled away.

CONTAMINATED SITES REGULATION/MANAGEMENT GENERALIZED SCHEME



The site-specific approach involves risk assessment (human health and ecological), treatment and/or containment and perpetual care. British Columbia is developing a contaminated site registry that will rank sites and have a computer link to land registry offices. Conditions of site-specific remediation include:

- a quantitative risk assessment;
- an environmental impact assessment;
- approved engineering solutions;
- inclusion of the site on the site registry;
- a monitoring and maintenance program;
- indemnification of the Crown;
- a restrictive covenant on use of the land; and
- financial security.

COAL HARBOUR

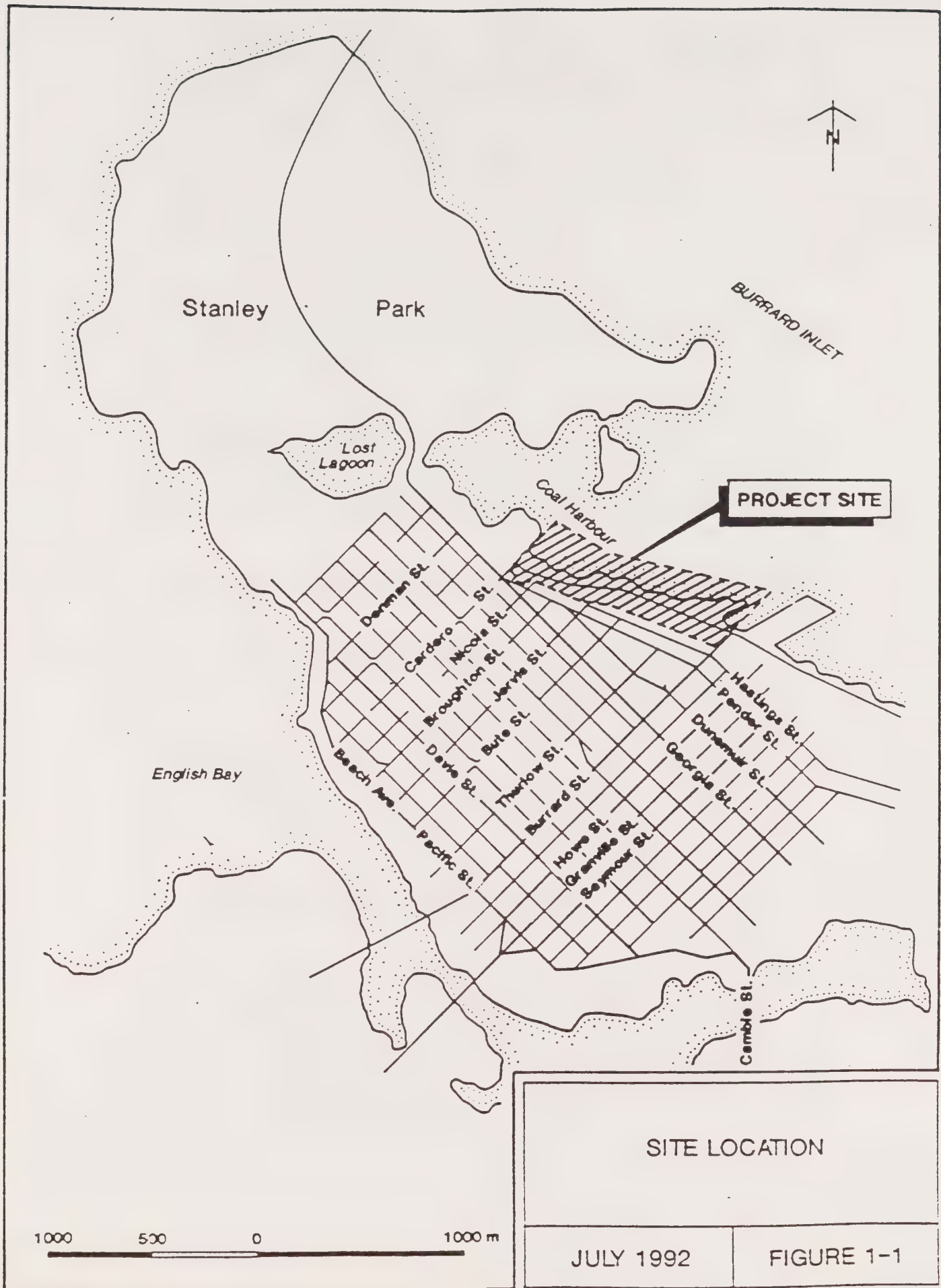
The Coal Harbour site is 16 hectares (40 acres), built entirely on landfill and owned by Canadian Pacific. (See map on page 49) It was formerly used for a ship fuel depot, forestry mills, ship building, and repair. Contaminants include mercury and arsenic. The focus of negotiation was a framework under which the company could redevelop a portion of the property, the income from which would be used to finance clean-up of the worst parts.

The Ministry required:

- overall site investigation;
- detailed remedial planning for phase one;
- plans for high-risk areas before development;
- an interim human health impact assessment; and
- parcel covenants over a ten year period, to ensure completion.

At the end of ten years of staged remediation under the risk assessment approach, protection of human and environmental health will be the same as if it had been achieved through the generic concentration approach. Environment Canada, the City of Vancouver, the Ministry of Environment, and the developer were involved in the negotiations, which took two years. This was a relatively short time and required a very strong manager with great organizational skills. (The pre-development work was to begin in June 1993.)

The communications aspect of remediating contaminated sites is crucial, well worth the time and money spent. Planning must be done as quickly as possible so that the development and remediation plans are carried out together; otherwise there will be a difference in the magnitude of costs for remediation.



Panel Discussion and Questions from the Audience

The panel, which was moderated by Suzanne Barrett, Director of Environmental Studies for the Waterfront Regeneration Trust, comprised Gerhard Seltsmann; Bill Mottershead and Rob McLenehan from Vancouver; and Karen Larkin, Tim Thompson, Brad Jones, and Bruce McDonald from Tacoma.

Suzanne Barrett opened the discussion, summarizing common themes from the day's presentations. These included:

1. Uncertainty kills investment. Government has an essential role in reducing uncertainty about standards, remediation strategies, and, in particular, liability.
2. Each situation has its own potential. Economic success depends on making use of local natural assets; in Germany, environmental data are used to inform land-use decisions.
3. The role of the public is vitally important, but how and when to involve the public must be carefully planned.
4. Timing is crucial. Planning for remediation and for future development should go together to ensure effective decisions and avoid unnecessary costs.
5. A regional approach is vital: co-ordinated clean-up provides economies of scale and site boundaries are not always relevant, especially in places where groundwater is involved. Considering an entire area makes it possible to set remediation priorities.

6. Viewing soil as a resource is consistent with the ecosystem approach. Over the long term, contaminated soils cannot be treated as waste and disposed in landfilled sites.
7. Common sense is basic, whether used as Gerhard Seltsmann did as a term to describe the development of a common understanding among all parties, or whether it means developing an approach that is practical, protects human and environmental health, and is cost-effective.

The panel was then invited to comment.

Bill Mottershead pointed out that today's contamination detection technology is so sophisticated that everything can be called contaminated. We should talk about grades of soil quality, not contamination.

In answer to a question from the audience about legal instruments to be used to ensure continued safety if contamination is contained and left on-site, he explained that British Columbia does not yet have its contaminated site registry fully in place. However, a covenant is registered on title and the plan is to link the site registry with the land titles registry.

Asked whether landowners could excavate, Rob McLenehan of Vancouver explained that there is a restriction against doing so without special permission.

Brad Jones added that in Washington State, deed covenants would be placed on the title to the land, and there are municipal zoning controls and building and excavation permit requirements. An identified site will be listed in state or federal databases. Containment requires continuous monitoring.

A member of the audience said he was interested in the question of making decisions on a project basis versus a systemic, regulatory, non site-specific approach. Are there local incentives to give players confidence in the remediation control system? When is collective action considered more appropriate than individual site regulation?

Bill Mottershead said that, although there is no requirement in the False Creek area for landowners to examine groundwater, they do it in order to turn over a good site and minimize potential liability concerns.

Rob McLenehan pointed out that the sites will have to be cleaned up eventually. East of Pacific Place, 17 sites are being remediated individually. It might have been better to deal with them as a whole, but it is hard to overcome the legal parcel approach.

The same questioner wanted to know what factors call for cohesive action, given that, if there is geographic dispersal of contaminants, at some point circumstances may indicate it is better to treat the area as a package.

Another person in the audience then asked why the entire German coal mine is being done as one project.

Gerhard Seltsmann explained that there is an urban planning tradition that cities attempt to get help from the state if there are planning problems and a landowner is not co-operating with the municipality. If owners are not breaking the law, cities must convince them to develop an area. Until 1979, big companies in the Rhur region owned the mines and did not communicate with the municipalities. The state then established a fund and bought the old industrial areas: it is now the biggest owner of old industrial sites. In the late 1980s, some big companies started to think of redeveloping lands, as in Bottrop. The company there came to the municipality, saying it wanted to redevelop the land, which was what started the process.

There are often incentives from the state: it and the municipality will redevelop an old site and sell it to a new owner. Now there are more private-sector companies approaching the state to arrange deals on redeveloping sites.

Karen Larkin said there are three major incentives for cleaning up the sites in Tacoma:

- First, there is public pressure, concern about the city's image because it was on the federal list of the 115 worst sites in the country.
- Second, there is the question of economic development, which also relates to the city's image and to its ability to attract new development. The city has to be concerned about the effect lender liability will have on investors obtaining financing for redevelopment.
- Third, there is the matter of cost savings. By taking a proactive approach, Tacoma was able to get ahead of the regulators and drive the process, rather than waiting for the regulatory agencies to dictate a process.

Brad Jones pointed out that if the city had required site-by-site clean-up, the process would have been far too slow. The city, the state, and the federal government recognized the concern about migration of contaminants and, therefore, the logic of a broader clean-up.

One member of the audience wondered how the community pushed for change and how it participated. Bill Mottershead said that Pacific Place is part of a sales agreement and when the Province purchased the land, it did not believe it was seriously contaminated. The public was not involved early on but the provincial opposition received information about the site and involved the press and the public, which became alarmed about the issue.

Now the Ministry's mission is to inform resident associations about the project: people need access to the Ministry's office library and staff at any time. The Ministry goes out to schools to make presentations: it takes a lot of effort to go back and obtain understanding from people when they have already been misinformed by the press. Some dialogue has now been established.

Gerhard Seltsmann said that sometimes the developer, the municipality or the state will try to avoid the public, but this creates suspicion. It can then take years to allay these suspicions. In Germany planning processes are strictly open: people have access to the sites as often as they wish — and are invited to use them. Nonetheless, the media often report the facts inaccurately.

A questioner in the audience wondered about the focus of public concern. Aren't these concerns often legitimate?

Mr. Seltsmann said that the media informs by its own rules; the city has many properties with real dangers and about which it is uncertain. It tries to tell the people about the problems and admit it does not have all the solutions. In the case of the steel mill, people engaged themselves in the process. Because they simply showed up at meetings, the city asked them to be partners at the table but to respect the process, and it worked. They know the municipality doesn't have the answers but they are not suspicious.

When there are no people living nearby, it is hard to get the public interested in projects; even the media do not bother until there is a story about new buildings and jobs.

Tim Thompson of Tacoma said that the power of environmental groups in the Northwestern United States is in their use of the courts to achieve their goals. The Sierra Club sued the forestry agency for not fulfilling its mandate, and won. This held up forestry operations on government land for a long time. People in the Puget Sound area are very concerned about wetlands and will sometimes defend them against economic development. So far, the American system has not been successful: billions of dollars have been spent and taxpayers are still looking for results.

Tacoma's outreach program has four major components:

- First, an opinion-makers' brief is prepared and distributed.
- Next, the media are involved, and information is prepared to appeal to them: pipes going into the ground make a better story than a new software package that makes remediation safer.
- A special TV program is then presented on local cable channels. In addition, there is a speakers' bureau that sends people to service clubs and other organizations to explain the project.
- The city also reaches out to the opposition, particularly those who want higher standards or are opposed to public spending on development. Tacoma needs to understand opponents, learn from them, and make changes where possible.

Karen Larkin said that Tacoma has learned some hard lessons: for example, in preparing for a new landfill site, officials neglected to inform the public that groundwater would be suitable for drinking — an important point — and, because it was their only source of drinking water, people became very concerned.

The city now takes a more proactive approach. There are apartments, now owned by the city, within sight of the landfill; when the site was excavated, some barrels were discovered. Several days in advance of sending in staff in "moon suits" to examine the barrels, the city informed the apartment-dwellers of its plans and set up a telephone hot line.

Gerhard Seltsmann pointed out that education and participation are different. Public participation is not always successful. In an area where Frankfurt planned to modernize 3,000 flats and build 3,000 new ones, attempts to involve tenants in the designs were unsuccessful. Now that people are ready to live in them, there are complaints about design errors. In this case, participation led to the people feeling that they were owners and owners are very critical. The aim cannot really be to satisfy all of peoples' expectations but to serve and stabilize democracy.

A person in the audience commented that large publicly owned tracts of contaminated land do not appear to be the norm. Even in Toronto, which has one of the largest areas of public contaminated urban land in North America, there are parcels of private land between the public lands. Development will be carried out in different stages, making it hard to apply an overall view to the entire area.

Bill Mottershead said that False Creek is a large area with many small contaminated sites. To date, it has not been possible to arrive at a consensus, to get people to the table to talk about a remediation plan.

Rob McLenehan said that the clean-up has had to be done in parts; while there is quality control, the Ministry recognizes that each site has individual characteristics. There is a large strip along the Fraser River with provincial, federal, and private land targeted for clean-up: it will be hard to carry out in the absence of a regional policy.

Brad Jones of Tacoma said that the original problem there was one of contaminated sediments, which meant dealing with the uplands first. The Lower Don is on a larger scale and involves a longer process. It is necessary to start from a regional basis, define the area, inventory the problems, and set priorities. There must be outreach to private owners to get them involved, as well as stronger regulations and incentives — both the carrot and the stick. The work must be done in phases. It is vital to gain control of the Upper Don Lands; otherwise, the Lower Don Lands will simply be recontaminated. It will probably take 10 to 15 years to resolve the myriad problems.

A member of the audience said that, while regulations can require action, it seems remediation is driven by redevelopment and change in land use. Land assembly is very difficult: for example, the Ataratiri site just sits unused, in part because of the cost of clean-up. East of it are another 200 hectares (494 acres) of municipally controlled land, but this is unusual. Unless there is proven cross-boundary damage we have no way to force action.

Tim Thompson of Tacoma commented that, in Washington State, a situation like Ataratiri would have caused a public outcry: doing nothing would simply be unacceptable.

Rob McLenehan said that the community must decide what are acceptable short-and long-term risks; clean-up should not be enforced unless there are high risks.

A person in the audience asked about technologies — there has been a lot heard about containment and capping. Is there anything new in bio-remediation, such as using bacteria to eat oil or planting trees on a site?

Bill Mottershead said that British Columbia conducted a large treatability study for Pacific Place. Bio-remediation cannot work by itself: because of the mix of contaminants, they are using a train of technologies, going after the high-risk areas first and using the most cost-effective technology.

Rob McLenehan said that the Ministry has tried to use low-level contaminated water to irrigate tree farms but transportation is difficult and municipalities oppose transportation through their jurisdictions.

In Tacoma, Bruce McDonald said, they are still considering the potential for bio-remediation of hot spots, possibly using composting, as has been done on military bases.

A member of the audience asked about future liability for land that has been certified. Human health seems to be the key driver of standards, but what about ecosystem health? If Ontario's regulations were to require decommissioning of all contaminated sites we could not afford to oversee the process in all the sites. What resources are necessary and how can we limit the necessity of government overseeing the processes?

Cost effectiveness is an important criterion. In Tacoma the city sets the amount it can spend and then decides on how to get the biggest bang for the buck. There is no way of getting enough money to do everything, so we must identify and act on clean-up priorities.

Gerhard Seltsmann of IBA said that, in Germany, the government does not accept liability in every case.

Rob McLenehan of Vancouver explained that British Columbia landowners are not liable for negligence if they maintain up-to-date monitoring.

A person in the audience asked about the institutional means for closure: it seems to be just a policy on where the liability will shift.

Rob McLenehan said that people want closure so they can do something with the land — i.e., get financing from a bank. Closure is there to allow business to progress and to protect financial institutions.

Bill Mottershead pointed out that it is necessary to allocate resources to clean or monitor a site for the long term, perhaps ten years. A project cannot succeed if it is dependent on annual allocations of funds; there must be a multi-year business plan and a commitment to financing before the plan can be implemented.

A member of the audience wanted to know whether the reason 90 percent of petroleum contamination is bio-remediated in Washington is because landfill is too expensive. In Ontario it is cheaper to landfill and we need to get to the bottom of the pricing structure to understand why some technologies are cost-effective.

Brad Jones said it was necessary to remember that there is perpetual liability in Washington for landfilled material and that landfills do sometimes break.

A member of the audience commented that, in the long term, public involvement is necessary for proper solutions. The public leads and forces governments to do their job. Representatives from public interest groups should be hired and placed inside the process, not kept outside the door.

Another person said that exciting, innovative, at-source technologies are being developed but the current review process may not include them because they aren't fully established yet. The innovators should be included in the process, along with regulators and developers.

*Antoinette Wells
Director, Policy Development and Intergovernmental Relations
Ontario Ministry of Environment and Energy*

The Public Policy Perspective: New Directions in Ontario

The Ministry is working in partnership with the Trust to set new directions for redevelopment of Toronto's waterfront. There are two controversial "environmental" policies that have a direct impact on the proposed redevelopment strategy for the Lower Don Lands: environmental liability and decommissioning.

ENVIRONMENTAL LIABILITY

One of the consequences of business activity around the world has been the creation of contaminated sites. The Lower Don Lands are among the many sites in Ontario where conditions created as a result of past practices are environmentally unacceptable today.

Public policy can be considered in terms of two questions: How is responsibility for clean-up allocated? Who pays?

In Ontario today, liability for clean-up of contaminated sites is effectively allocated through the Environmental Protection Act and The Ontario Water Resources Act. Under the legislation, a director may order "an owner, previous owner, or a person who has or had charge, management or control of a source of a contaminant to stop and clean-up discharges to protect public health and the natural environment".

When the polluter is responsible, the polluter pays the cost of remediation. Problems arise when the polluter is not able to fund remediation. Who is liable then, who pays, and how much?

Across Canada, governments have been pressured by stakeholders, particularly the lending community, to address these questions, and, by developing uniform rules and standards, reduce the uncertainty and risk associated with environmental liability. This pressure resulted in the

creation and recent report of the Canadian Council of Ministers of the Environment's Task Group on Contaminated Site Liability.

THE CCME TASK GROUP ON CONTAMINATED SITE LIABILITY

In 1992, the Canadian Council of Ministers of the Environment (CCME), through a task group comprising four provinces, the Government of Canada, and five stakeholder organizations, addressed this issue on a national basis.

Its objective was to explore the issues surrounding the clean-up of contaminated sites and prepare a report on findings and recommendations for CCME ministers. Special emphasis was given to developing a set of guiding principles that CCME member jurisdictions could use to develop legislation, regulations, and procedures.

The principles were developed as the basis for harmonizing various member government methods for dealing with contaminated sites liability across Canada. CCME Ministers endorsed the report on May 13, 1993.

The report emphasizes a voluntary, co-operative approach and also encourages greater consistency in environmental policy and legislation across the country.

RECOMMENDED PRINCIPLES TO GUIDE LEGISLATION

The task group developed 13 key principles, in two categories of five underlying and eight specific principles.

In summary, the underlying principles are:

1. The idea that the "polluter pays" is paramount.
2. Fairness should be the goal.
3. The concepts of openness, accessibility, and participation should be enshrined in the contaminated site remediation process.
4. The beneficiary pays and there should be no unjust enrichment.
5. The basis for government action should be sustainable development, integrating environmental, human health, and economic concerns.

Regarding site remediation policies, legislation, and processes, the eight specific principles are:

6. A broad net should be cast in identifying those who are potentially responsible (while permitting special conditional exemptions for lenders, receivers, receiver-managers, and trustees).
7. Legislation should provide the authority and means to recover from those parties responsible the public funds expended on clean-up activities (CCME member governments should strive to give environmental charges priority over all other claims on an estate in receivership or bankruptcy).
8. Member governments should design a process to discourage excessive litigation, ensuring that clean-up of sites is efficient; that liability is fairly allocated; and that they promote the use of alternative dispute resolution mechanisms.
9. A list of "liability allocation factors" should be developed for cases in which more than one responsible party is to be considered (the task group's paper includes a suggested list).
10. Alternative dispute resolution mechanisms should be available to resolve liability issues and the paper suggests one model.
11. Rather than the present system, in which the member governments have discretion to designate contaminated sites, governments should establish clear policies on such designations.
12. An official "Certificate of Compliance" should be issued to a responsible party once a contaminated site has been remediated to the required standards, the certificate stating that the responsible party may be held accountable for future clean-up if that is appropriate.
13. Benchmarks should be developed for cleaning up contaminated sites.

NEXT STEPS

In the coming months, the task group will continue working on two areas: preventing future site contamination, and finding innovative ways to fund clean-up activities.

Environmental liability is a shared problem and solutions must be shared. In the next several months, Ontario Ministry of Environment and Energy (MOEE) staff will review the report of the Task Group on Environmental

Liability. It is also awaiting the report of the Environmental Liability group established under the Green Market Opportunities program, a Green Industries initiative. The Ministry will formulate proposed policies, based on their recommendations.

DECOMMISSIONING AND TREATMENT OF CONTAMINATED LAND

In Ontario, there are currently no legislated requirements for decommissioning or remediation of contaminated sites. Nor are there any legislated standards for these activities.

Under current legislation, the MOEE may recommend site remediation. For example:

- as a condition of approval through a legal processes such as the Environmental Assessment Process;
- where MOEE is asked to comment on a change in land use or municipal plan amendment, it may request that site remediation be undertaken as a condition of approval; or
- the Director may order site remediation under the Environmental Protection Act or the Ontario Water Resources Act to stop or reduce contamination in response to a threat or perceived threat of harm to the environment.

The current MOEE Guidelines for the Decommissioning and Clean-up of Contaminates Sites are simply that — “guidelines”. Under them, in principle, clean-up should be initiated wherever contaminants are present at levels that exceed background levels.

Proponents may follow one of three options:

- apply relevant MOEE policies and guidelines;
- where appropriate, apply clean-up criteria developed in other jurisdictions; or,
- develop and apply site-specific criteria.

Under the latter two options, the onus is on the proponent to demonstrate that human and environmental health values are protected.

Key criticisms of the current policy focus on:

- the lack of regulatory certainty;
- the cost-effectiveness of the present approach; and
- the lack of clear standards.

All of these may operate as a bar to investment in site remediation.

To this end, the MOEE has undertaken a revision of the guidelines. Among other things, the review will examine:

- approach to clean-up;
- depth of clean-up;
- clean-up levels;
- alternative responses to remediation;
- registration on title.

Our review of the decommissioning guidelines is designed to facilitate opportunities for redevelopment while ensuring environmental and human health protection.

We expect to develop a document that will be released for public consultation, probably in the fall of 1993.

CONCLUSION

There is no single public policy perspective on the issues facing the Lower Don Lands and there is no single public policy solution. The Lower Don Lands pose a unique challenge and an opportunity to policy-makers. The challenge lies in finding new policy processes and directions that can reconcile a broad spectrum of perspectives which we bring to the task of designing a redevelopment strategy. The opportunity lies in our collective ability to use the Lower Don Lands as a test for developing new innovative approaches to integrating environmental protection, remediation, land use, transportation and community planning.

I hope that what I have had to say today will give you some insight into the new directions in which MOEE is moving. I want you to understand that we are aware of your very strong concern and the concern that the lending community and the development industry place on this issue, and we are very sensitive to your desire for greater policy clarity and certainty.

This is not the end of our dialogue, it is just the beginning.

Case Study 4: Lower Don Lands

4.1 Lower Don Lands: An Overview

presented by Michael Kirkland, Kirkland Partnerships

4.2 Lower Don Lands Site Remediation Strategy

Beth Benson, Waterfront Regeneration Trust

CASE STUDY 4.1: LOWER DON LANDS

Michael Kirkland
Project Director, Lower Don Lands Strategy
The Kirkland Partnership

The Lower Don Lands: An Overview

Mr. Kirkland opened with a slide presentation and description of the various parts of the site and their shared problems and opportunities (see Background Paper, Appendix 1).

As recommended by the Royal Commission on the Future of the Toronto Waterfront, in its *Regeneration* report, work on the Lower Don Lands should be integrated to ensure that such issues as flooding and soil/groundwater contamination, rehabilitation of the Don River, access and economic renewal, are addressed and resolved comprehensively and cost-effectively.

The purpose of the Lower Don Lands Strategy, which is being co-ordinated by the Waterfront Regeneration Trust, in consultation with governments, business and community interests, is to prepare recommendations for regeneration of the area, including environmental protection/remediation, land-use, community, economic and transportation considerations. The strategy will be based on the ecosystem approach, the nine waterfront principles first described in *Watershed* (1989), and sound economic planning. A draft of the Strategy will be published as a basis for public consultation in early 1994.

The work is being carried out by six work groups: Community, Environment, Site Remediation, Transportation, Economy, and Synthesis. The work groups are proceeding in a two-phased program, each phase lasting three months. As part of their work it is very important to identify and address the limitations and opportunities presented by soil and groundwater conditions in the Lower Don Lands.

CASE STUDY 4.2: LOWER DON LANDS

Beth Benson

*Chair Site Remediation Work Group
Waterfront Regeneration Trust*

The Lower Don Lands: Site Remediation Strategy

A cornerstone of the Lower Don Lands strategy is developing a protective, integrated, and cost-effective approach to site remediation. The Trust has established a multi-stakeholder Site Remediation Work Group to identify the issues, consider options, and prepare proposals for consideration by the Environment and Synthesis work groups.

Investigations of soil and groundwater quality in the Lower Don Lands include the work on the Ataratiri site by the City of Toronto, the environmental audit of the East Bayfront/Port Industrial Area carried out by the Royal Commission on the Future of the Toronto Waterfront, studies by the Toronto Economic Development Corporation and by the Toronto Harbour Commissioners, and various investigations undertaken by private landowners.

In many places, soils are contaminated with heavy metals and organic chemicals in excess of current Ontario Ministry of Environment and Energy (MOEE) guidelines. The nature and extent of contamination varies widely across the study area and conditions across a single site can be heterogeneous and unpredictable. At some locations, groundwater is contaminated with heavy metals, organic compounds, and free-phase floating petroleum products.

The extensive investigations carried out by the City of Toronto on the 32 hectare (79 acres) Ataratiri site found that soil quality in approximately half the area does not meet current (1989) MOEE guidelines for residential, commercial or industrial uses. As noted in the background paper (see Appendix 1), about 41 percent of the fill exceeds industrial guideline concentrations for one or more contaminants; 12 percent is between residential and industrial guidelines; and 14 percent meets the residential guidelines. The remaining third of the area is untested because it was inaccessible at the time site investigations were carried out.

The contaminants of concern at Ataratiri have been grouped into three categories: metals, PAHs, and PCBs. Metal contamination is generally limited to the fill's metre to metre and-a-half depth. Evidently, the distribution of PCBs is limited to isolated areas where there were scrapyards operations. The highest levels of PAH contamination occur in the western part of the site, where, until the 1960s, there was a coal gasification plant. The cleanest soil is located in the centre of the area, where rail-related activities were located.

The renewal of these lands depends, in large measure, on developing an approach to site remediation that both protects human and environmental health and is financially feasible. For example, important economies of scale may be realized by considering clean-up needs on an area-wide basis and by identifying clusters of sites based on similar kinds and degrees of pollution, the potential for migration of contaminants from one site to another or to nearby surface water, and expected future uses.

Examining the full range of technological, land-use, and management strategies to ensure an integrated response to the site remediation challenge will turn a problem into an opportunity. Responses that ensure long-and short-term protection of human and environmental health are the basis for viable regeneration of the Lower Don Lands. Workshop participants are encouraged to explore innovative responses to contamination and to consider all components of the biophysical ecosystem.

Professor Detlef Mertins
University of Toronto,
School of Architecture and Landscape Architecture

Professor Mary Lou Labsinger
University of Waterloo, School of Architecture

A Culture of Regeneration

Professors Mertins and Labsinger gave a richly illustrated humorous and provocative presentation, the text of which follows.

PROFESSOR MERTINS

The calls made in *Regeneration* to forge new integrative approaches to planning should be reinforced and that field should be expanded to include culture as well as environmentalism and economics. While it may surprise some people, artists, writers, poets, philosophers, architects, and landscape architects have long been raising seemingly “technical” questions about remediating contaminated sites. Instead of offering the chimera of technical “solutions”, those involved in culture have sought to be engaged in issues of technology, nature, progress, perfectibility, cleanliness, body, myth, and matter.

Critical and self-reflective, they have a special contribution to make to the difficult negotiations that must take place in respect of the Lower Don/Port Industrial Area. Their ability to change people’s perceptions and ways of thinking helps society work through its collective repressions and outdated norms, to create new metaphors. This could not only contribute to rethinking the site, but could even inform planning in unexpected but potentially catalytic ways.

In the past three decades, the emergence of environmental art has begun to have a profound effect on design. It also has the potential to renew what we think of as the art of city-making, of shaping the urban landscape. Working across the old boundaries of architecture, landscape architecture, and art, this new paradigm expands the field of those able to address natural, urban, and industrial sites in provocative and stimulating

ways, bringing critical intelligence, wit, and imagination to what can no longer be considered a "purely technical" matter.

PROFESSOR LOBSINGER

Dirt and cleanliness can be considered as a way of beginning to think about the Lower Don because these are symbols that form an integral part of the collective imagination of every culture.

Prior to the technical exigencies of toxicity, bacteriology, and medical materialism, dirt, as defined by cultural anthropologist Mary Douglas, is "matter out of place" or "that which violates systematic ordering". Where there is dirt there is a system: dirt is the by-product of the systematic ordering and classification of matter, in so far as ordering involves rejecting inappropriate elements. Dirt, analogous to disorder, is that which is rejected because it contravenes order. This paradigm sets up a system of classification in which binary oppositions, such as order and disorder, produce intransigent categories of either/or.

Second, in approaching the symbolic constructs of dirt and cleanliness, it is necessary to understand these at their original and most profound site, our bodies, because all symbolic constructs begin with, and affect, our sense of bodily boundaries. We cannot think about our material existence without thinking about our bodies as physical, spiritual, and symbolic entities. For example, we know that, while shoes are not dirty in themselves, placing them on the dining-room table is. Food in itself is not dirty, but food on the floor is: reversing the placement of shoes and food, confusing the table for the floor and the floor for the table, violates a system of ordering. Neither would be a problem if they did not directly correspond to our bodies: our feet and our mouths come in contact and the hierarchy of the body is disrupted as a boundary is transgressed.

This example may be extended by analogy to the Lower Don and its location within the city. Its existence in between nature and city, industrial wasteland and recreational area, is anomalous and deviates from the rationalized surface of the city. The lack of conformity and the persistent ambiguity of the area defy some of our most deeply held convictions, especially our cultural propensity for order, control, and cleanliness.

Lying at the margins of a system, the dirt of the Lower Don/Port Industrial Area has the symbolic power to infect established orders. It is as full of mysteries as it is of problems. Simultaneously ordered and disordered, within the city but not of the city, a wilderness but not natural, at moments it is visually beautiful but always invisibly dangerous. We are drawn to and repelled by it. Alive with reversals and

contradictions, it belongs to the carnivalesque. It is a source of discomfort, not only because of its pathogenicity — we are surrounded by toxic conditions everywhere — but because it resists definition, because of its ambiguous state of being, its unruly placement. In thinking about cleanliness, dirt, and the Lower Don, we should examine the problem of exclusive categories and consider the possibility of a “both/and” construct in which order and disorder exist simultaneously in a powerful and creatively regenerative relationship.

Lower Don Lands Break-out Group Sessions

The workshop participants were divided into four break-out groups for the remainder of the workshop, and asked to consider questions the Waterfront Regeneration Trust had posed to them about the Lower Don Lands. The discussions were lively, ranged broadly, and were sometimes controversial. The animators did not ask groups to reach clear consensus; the following précis is based on animators' notes and impressions regarding some key points.

BREAK-OUT GROUP A: LOWER DON LANDS

Animator: Phil Ferguson
Canadian Urban Institute

Planning for Sustainability: The Site Remediation Imperative

The group was asked to address the following questions:

1. What are the implications for the Lower Don Lands of the new economy?
2. What are the incentives to start cleaning up the Lower Don Lands?
3. What range of uses is envisioned for the Lower Don Lands?
4. Who are the stakeholders and what are their interests?

The group saw the need for a paradigm shift if these questions are to be answered: there must be a commitment to keeping the central city vital within the region. Although there is a need to think regionally, planners and others are not trained to do so. The Royal Commission on the Future of the Toronto Waterfront made this point in developing its perspective on the Toronto area as the Toronto Bioregion.

1. One of the main implications is that all cities in G7 countries are being told to do the same thing: focus on high-technology, knowledge-based industries. Toronto will have to find a particular niche or two in which it can effectively compete; one area being ignored is import substitution and the potential to have the economy grow as the result of internal demand. There may be a potential, particularly for developing community energy systems, that could dramatically reduce imports of energy and create an exportable technology and know-how.

2. In considering incentives to start cleaning up the Lower Don Lands, the cost of not cleaning up must be considered, including the development of more urban sprawl, with its consequences of destroying farmland, encouraging commuting, leaving the downtown an empty shell at night, and high-polluting, auto-based transportation. If important downtown sites like the Lower Don Lands are not revitalized, Toronto could begin to look like an American inner city.
3. The area is so large and varied that there must be a great number of small planning areas within it, with a use envisioned for each to fit the needs of the city in its role as the region's centre. Although the focus seems to be on the waterfront aspects of the Lower Don Lands, plans for Ataratiri could be revitalized, to make it a mixed-use neighbourhood. A general strategy for the area is needed but does not have to be "all or nothing": it could be developed and implemented incrementally.
4. The area is so large and its potential is so great that the stakeholders include regional interests. Under the ecosystem approach, the Lower Don Lands cannot be redeveloped to be sustainable without a commitment from upstream municipalities and leadership from the provincial government.

BREAK-OUT GROUP B: LOWER DON LANDS

*Animator: Karen Clarke Whistler
Beak Consultants Ltd.*

Protective, Responsible, Cost Effective Site Remediation: An Ecosystem Approach

The group was asked to consider the following questions:

1. What is the nature of the site and why are we concerned about it?
2. Who decides what conditions, uses, and responses are acceptable?
3. How do we decide what level of management/remediation is acceptable?
4. What sort of framework could be developed to achieve these objectives?

1. In response to the question of the nature of the site and concerns about it, the group identified numerous organic and inorganic contaminants in the Lower Don Lands' soil and groundwater.

Although uncertain that enough information exists to accurately identify the extent of contamination in the area, the group was certain that the clean-up must be started. It also identified several ways in which contaminants may possibly reach people, fish, and animals, although there is a poor understanding of just how contaminants reach receptors via the various pathways. The group was not clear on how to integrate the ecosystem approach into site remediation requirements.

Discussion ranged from regulatory constraints on developers to human health, safety, and wildlife concerns, and how to develop a vision without knowing precise regulatory, liability, and financial

constraints that will limit the possibilities; the level of clean-up depends on the land use envisioned.

2. Who decides what conditions, uses and responses are acceptable? What is considered technically acceptable may not be socially acceptable, and there are local, regional, national, and international interests involved. The main focus should be on those most likely to be receptors of contamination, which includes workers and future residents of the site, as well as nearby neighbours. In considering how to involve people in setting acceptable standards, it should be noted that public consultation initiatives often create an adversarial relationship. The German approach, having members of the public serve as members of decision-making committees, is a possible model.
3. The question of deciding what level of management/remediation is acceptable led to a long discussion of risk assessment, raising more questions than answers. Acceptability depends on properly identifying pathways and potential receptors; perhaps worst-case scenarios should be considered and specific criteria developed, based on those scenarios. Annual testing and regular updating of remediation should be part of the management plan. Financial institutions will also have a significant role to play, while lenders will need assurances that a site is "clean".
4. In discussing the kind of framework that could be developed to achieve identified objectives, it became clear that the most basic definitions of the project must be clarified. Given that what is technically acceptable may require a different standard than what is socially acceptable, it is necessary to understand public perceptions and priorities when deciding what is practical and affordable in cleaning up sites.

BREAK-OUT GROUP C: LOWER DON LANDS

*Animator: Lynn Calder
Shell Canada*

Responses to Contamination: Opportunities for Canadian Expertise

The group was asked to consider the following questions and issues:

1. What are the possible responses/technologies?
2. What should be the criteria for evaluating responses/technologies?
3. What techniques are emerging or currently available?
4. Identify obstacles and actions.
5. Identify funding and support mechanisms.

The group answered the first and third questions in tandem. They noted that the generic techniques, technology/responses categories are: destruction, separation/recovery, and containment, all of which can all be either off- or on-site. They then listed the following technologies as potentially applicable to the Lower Don Lands: thermal, interim storage, soil washing, no action (only for low risk sites), containment (both hydraulic and physical), stabilization/fixation, excavation and disposal, bioremediation, ecological engineering, organic destruction (photo-oxidation, photocatalysis), chemical, vapour extraction, landfilling, beneficial reuse/recycling, natural regeneration, landfarming, and developing technologies.

Sufficient technology exists now to treat the soils in the Lower Don Lands. In just the past two years more options have become available. No single technology can deal with all contaminants; therefore, the technology will have to be selected for its compatibility with site specific requirements.

In response to the second question, the group listed 19 different criteria including: flexibility (fit into the treatment train), cost (including future liability), meeting clean-up goals of proponent and public, compatibility with future land use, timing to fit schedule, mobility (useable at other sites later), value added (creation of useable products), and Canadian/Ontario content. It was noted that current costs and regulations drive proponents to choose to excavate and haul as the preferred response; this must be changed to support cleanup and recycling of soil.

In answer to question four, the group identified numerous obstacles and required actions, including the following:

- The regulatory framework is slow, cumbersome, and confusing, and there is a need for an information network that would provide up-to-date information on technology and regulations to all those involved.
- The Ontario Ministry of Environment and Energy (MOEE) should give blanket certification for specific technologies.
- MOEE guidelines are applied unevenly across the province.
- The designation of soil from remediation operations as a waste rather than a value-added product must be amended to support treatment technologies. The treatment of soil needs to be promoted.
- Uncertainty about liability means there is a need for recognized standards and a protocol for evaluating technologies.
- The low cost of disposal of soils is a barrier to the use of treatment technologies.
- There is a lack of standardization in estimating the total costs of remediation, which should include all facets of the process.
- There is a need for streamlined approvals processes, provincially and municipally, including co-ordination of project review.
- There is a lack of programs to demonstrate commercialization of technologies.

Unfortunately, the group did not have time to address the question of identifying specific funding and support mechanisms. However they did offer the following conclusions:

- Technologies are now available and technology development is ahead of progress on the government's approvals process. Obstacles do exist but they are not insurmountable. The

commercialization of new and emerging technologies requires support of demonstrations to show economic and technical effectiveness.

- If obstacles are not addressed, remediation cannot proceed in a timely, cost-effective manner. The current regulatory framework and relative costs encourage excavation and disposal. Under specific conditions of low risk there should be consideration of other options as appropriate, including no action, stabilization, containment or natural regeneration.
- There is a need for a master plan, including identification of potential purchasers of cleaned-up sites, to be put forward by a committed proponent in order for remediation to proceed under the current regulatory environment.
- There is a need for standardization of the risk assessment approach.

BREAK-OUT GROUP D: LOWER DON LANDS

*Animator: Antoinette Wells
Ministry of Environment and Energy*

Environmental Liability: The Costs — Who Pays and in What Proportion?

The group considered the following questions:

1. What are the problems?
2. What are the solutions?
3. Who should be responsible?

The problems are:

1. lack of communication between regulators and affected parties, particularly on roles and responsibilities, requirements, process;
2. lack of strategic direction on the government's plans with respect to the environment;
3. lack of clear, practical, predictable standards, and uncertainty about enforcement;
4. lack of understanding regarding the extent of liability;
5. a need to define roles and protocols for a risk assessment approach;
6. a need for fairness in identifying and apportioning liability: why should those who do not cause contamination pay? The fact that lenders are concerned about future liability if standards change kills investment;
7. uncertainties that make it difficult to finance clean-ups;
8. potential revenues from a site that may not justify clean-up costs.

The solutions:

1. standardize risk assessment procedures; risk assessment may be the only realistic approach for large sites;
2. clarify the confidentiality of reports and audits to reduce uncertainty about liability for assessing a site;
3. revise Decommissioning Guidelines, especially with respect to: depth of clean-up, registration on title, groundwater, use of risk assessment, roles, and responsibilities;
4. a more proactive stance by MOEE in investigating risk assessment and other approaches from other jurisdictions, as well as leadership in policy development, rather than just reacting to criticism of the current system;
5. create public/private partnerships: MOEE agreements and indemnities could reduce investment risk and attract capital;
6. standardize such practices as public/private agreements and site audits, which could reduce costs;
7. undertake a detailed examination of potential funding mechanisms.

The responsibility:

The question of responsibility led to significant discussion: should landowners be responsible, especially when dealing with past contamination not caused by current owners? There is also concern about changing standards and future liability, even when today's standards have been met. Given that so many of us have benefitted from the end products of polluting processes, which we collectively failed to control, perhaps we will all have to pay via taxes. There is a need for alternative dispute resolution mechanisms to lead on apportionment questions.

Closing Plenary Session

At the end of the workshop, there was a final plenary session, moderated by Maureen Farrow, at which the animators presented results from the break-out groups. Maureen Farrow commented briefly on the presentations and the audience also provided comments.

With respect to **Group A, Planning for Sustainability: The Site Remediation Imperative**, Ms. Farrow commented that import substitution should not be considered a significant factor for the future of the Greater Toronto (GTA): it will not supply an area with a population of six to seven million people. The GTA must strive to create value-added activities even if other cities are doing the same. Ninety percent of what Ontario produces is exported and 30 to 40 percent of jobs in the province are export-based. Therefore, we must keep focused on exports and capitalize on our strengths. Immigration is the key to refuelling the workforce.

In reference to **Group B, Protective, Responsible, Cost Effective Site Remediation An Ecosystem Approach**, Ms. Farrow asked how one defines social acceptability (in the context of risk) in environmental terms, and who is to decide this matter. Do we have an environmental problem in the Lower Don Lands or a social problem? The answer is partly a matter of defining standards.

Commenting on **Group C, Responses to Contamination: Opportunities for Canadian Expertise**, Ms. Farrow noted that redevelopment of the Lower Don Lands will present a showcase opportunity for the development and export of technology, just as Toronto's showcase transit system has contributed to Canada's success in penetrating the American market for transit vehicles.

In reaction to the **Group D, Environmental Liability: The Costs — Who Pays and in What Proportion?**, Ms. Farrow said that we can set standards for the clean-up of, and liability for, sites contaminated by present and future activities but difficulties arise with sites contaminated in the past. The issue boils down to a question of who pays and how much, and how can a non-polluter be made to pay? Despite the high tax burden now, if there is a collective responsibility for past contamination, then perhaps taxes should fund the clean-up. We could make consumers pay through the pricing mechanisms for current clean-up but we cannot really retroactively charge consumers for past contamination. Perhaps lower but protective standards and increased flexibility provide the key to affordable clean-up.

Antoinette Wells of the Ontario Ministry of Environment and Energy (MOEE) noted that, as a large landowner, the government, and thereby the public, bears a large degree of liability already.

NEXT STEPS

A member of the audience asked about the next steps toward regenerating the Lower Don Lands. David Crombie, Commissioner of the Waterfront Regeneration Trust, replied that those involved in the Lower Don Lands Strategy will integrate all land use planning concerns (environment, transportation, economy, community, etc.) in the formulation of recommendations as part of the Lower Don Lands Strategy over the next several months. This workshop was just one step toward the preparation of the concept plan. Once the strategy has been reviewed and public discussions have been completed early in 1994, an implementation plan will be drafted, as was done for the Garrison Common.

Summary and Conclusions

Participants in the Site Remediation Workshop included practitioners and decision-makers in all sectors interested in site remediation, brought together to exchange information, ideas, and experiences and to help formulate a responsible, affordable remediation strategy for the Lower Don Lands. The workshop dealt with a number of issues, including approaches taken by other jurisdictions, their regulatory frameworks, the range of acceptable responses, economic and regulatory incentives for clean-up, and environmental liability.

CONCLUSIONS

The most important conclusion was that it is not only necessary to remediate and regenerate the Lower Don Lands, it is possible. Participants concluded that, to achieve that goal, the following considerations must be addressed:

- public policy reform must be undertaken to eliminate regulatory uncertainty;
- from the outset, public participation is essential to the process;
- partnerships are essential, especially between public and private-sector bodies, in order to reach a satisfactory outcome, and they are particularly important in the current climate of severe fiscal restraint;
- land-use planning must be informed by environmental conditions, in the same way that responses to environmental degradation must reflect land-use goals in an iterative process;

- there are now diverse soil and groundwater management and remediation techniques that have potential application to conditions in the Lower Don Lands;
- the area is an ideal location for testing promising site-remediation techniques; and
- innovative solutions to concerns about environmental liability are possible and there is a willingness to develop them.

Appendices

- 1. LOWER DON LANDS: SITE REMEDIATION CHALLENGES AND OPPORTUNITIES: A BACKGROUND PAPER PREPARED FOR THE WORKSHOP**
- 2. LIST OF REGISTRANTS**
- 3. BRITISH COLUMBIA BILL 26, WASTE MANAGEMENT AMENDMENT ACT: AN OVERVIEW**
- 4. WASHINGTON STATE MODEL TOXICS CONTROL ACT**
- 5. WATERFRONT REGENERATION TRUST PUBLICATIONS UPDATE**
- 6. CANADIAN URBAN INSTITUTE PUBLICATION UPDATE**

**Lower Don Lands:
Site Remediation
Challenges and Opportunities:
a background paper prepared
for the workshop**

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The Lower Don Lands: Site Remediation Challenges and Opportunities

**SITE REMEDIATION WORKSHOP
MAY 25 and 26, 1993**

**WATERFRONT REGENERATION TRUST
207 QUEEN'S QUAY WEST
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Toronto, Ontario**

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We thank our exhibitors: HBT Agra, Tallon Metal Technologies, ELI Eco Logic International Inc., Bioquest, Matrix Photocatalytic Inc., Groundwater Technology and Hazardous Materials Management.

THE LOWER DON LANDS:

SITE REMEDIATION CHALLENGES AND OPPORTUNITIES

INTRODUCTION

This paper was prepared as a background paper to facilitate discussion of site remediation challenges, opportunities and strategies at the Site Remediation Workshop, held on May 25 and 26, 1993 at the Waterfront Regeneration Trust. The paper includes:

- a description of the Lower Don Lands and the soil and groundwater conditions there;
- a summary of the Ontario approach as of May 1993 to site decommissioning and cleanup, and its limitations;
- a brief description of possible alternative cleanup approaches;
- an outline of options for responding to contamination in the Lower Don Lands; and
- a summary of environmental liability issues.

The paper presents a diversity of issues and options, and it is hoped that discussion at the Workshop will provide directions for the preparation of a practical, cost-effective and responsible site remediation strategy for the Lower Don Lands.

The Site Remediation Challenge

There are many sites in Ontario where soil and groundwater have become contaminated through past uses of the land and/or filling practices. These contaminated sites represent a major obstacle, both environmentally and economically, to redevelopment in urban centres throughout the province. Atarotiri is a recent example in the Greater Toronto Bioregion where the high costs associated with soil and groundwater remediation contributed to the decision by the Provincial Government to cancel the project.

Uncertainty associated with cleanup requirements and the significant costs associated with Ontario's current approach are recognized as deterrents for investment in remediation and for the reuse of contaminated lands. Financial institutions have declined to fund projects where there is uncertainty about their environmental liabilities and the costs associated with cleanup. The Canadian Banking Association, the Canadian Housing and Mortgage Corporation, and other financial associations have identified the cleanup of contaminated lands as a priority policy issue. In addition, public concerns have focused attention on the need to ensure that soil and groundwater conditions do not present unacceptable risks to human health and safety and the environment.

There is an urgent need to review and improve the Ontario requirements and procedures for cleanup of contaminated lands, and to develop a response to site remediation that is sound from ecosystem health, legal, and economic perspectives. As an initial step to meeting these needs, the Ontario Ministry of the Environment and Energy is currently reviewing its *Guidelines for the Decommissioning and Cleanup of Sites in Ontario*.

The Lower Don Lands

The Lower Don Lands comprise 1700 acres strategically located at the mouth of the Don River in Toronto. They include: the west and east sides of the Lower Don, the Ataratiri site, the Gooderham and Worts site, the East Bayfront, the Port Industrial Area, the semi-natural areas of the Leslie Street Spit, the north shore of the Outer Harbour, and the parklands of Ashbridge's Bay.

Much of the Lower Don Lands is in a state of transition, with many former activities gone or in decline, and many recent studies and plans directed towards revitalizing this part of the City. The area is only minutes from downtown Toronto, but much of it is underutilized, rundown, and neglected. To date, many of these areas have been considered and planned as separate pieces, although they share many features.

The various elements of the Lower Don Lands:

- share an interesting history;
- are generally underused and are in a state of transition;
- lie predominantly in the floodplain of the Don River;
- have similar environmental concerns;
- have poor links to the rest of the City;
- in large part, are publicly owned;
- are strategically located close to the City; and
- can take advantage of their position on the Lower Don River and the Inner and Outer Harbours.

In light of these shared challenges and opportunities and the many studies and plans for specific parts of the area, the Royal Commission on the Future of the Toronto Waterfront recommended in *Regeneration* that all this work should be integrated to ensure that issues such as flooding and soil/groundwater contamination, rehabilitation of the Don River, access and economic renewal are addressed and resolved in a comprehensive, cost-effective manner.

The Lower Don Lands Strategy

The purpose of the Lower Don Lands Strategy, being coordinated by the Waterfront Regeneration Trust, is to prepare options for the regeneration of the study area, including environmental protection/ remediation, land use, community and transportation considerations. The strategy is based on the ecosystem approach, the nine waterfront principles first described in *Watershed* (1989), and sound economic planning.

The renewal of these lands depends in large measure on developing an approach to site remediation that not only protects human and environmental health but is also financially feasible. There may be important economies of scale that can be realized by considering cleanup needs on an area-wide basis. For example, it might be possible to identify clusters of sites on the basis of similar kinds and degrees of pollution, the potential for migration of contaminants from one site to another or to nearby surface water, and expected future uses.

The potential exists to turn a challenge into an opportunity by examining the full range of technological, land use and management strategies to ensure an integrated, protective and cost-effective response to the site remediation challenge.

SOIL AND GROUNDWATER CONDITIONS IN THE LOWER DON LANDS

Physical Conditions

The Lower Don Lands share many environmental concerns: most of the area lies in the floodplain of the Don River; and air, water, soil and groundwater conditions are degraded in many locations. Noise, odours and dust levels are a concern for those who work in the area and for the nearby residential community of South Riverdale.

Soil and groundwater conditions are perhaps best understood from a knowledge of how the area was created and how it has been used. Much of the study area has been created over the past 80 years by lakefilling using a wide range of materials. For example, much of the Port Industrial Area was filled with construction debris, sewage sludge, incinerator ash, and municipal garbage in addition to sediment dredged from the harbour area. Construction of the Leslie Street Spit utilized earth excavated from downtown Toronto in addition to rubble, incinerator and fly ash, and crushed battery casings. These filling practices undoubtedly explain the presence of some of the contaminants measured in the Lower Don Lands in recent years. In the rail corridors, Ataratiri, and the Port Industrial Area, soil and groundwater conditions have been further degraded by spills, leaks, disposal of hazardous materials and airborne deposition of contaminants related to local industrial activity.

The overburden in the study area is best described as heterogeneous. At Ataratiri, the natural material is 8-10 m thick, except near the Don River where it reaches a depth of 30 m. In the East Bayfront/Port Industrial Area, two layers of fill lie over the original lakebed sediments. The surficial fill layer is comprised of the wastes listed above, and is 0.5m to 2.5 m thick, extending to a depth of 8 m in the southeastern areas. The deeper fill consists of sediments dredged from the harbour and lakebed, and is 0.6 to 8 m thick.

Soil and Groundwater Quality

Numerous investigations carried out in the Lower Don Lands over the past five years have reported on soil and groundwater conditions. In many places soils are contaminated with heavy metals and organic chemicals in excess of current Ministry of Environment and Energy guidelines. The nature and extent of contamination varies widely across the study area and conditions across a single site can be heterogeneous and unpredictable.

In November 1989 an environmental audit of the East Bayfront/Port Industrial Area was initiated by the Royal Commission on the Future of the Toronto Waterfront, at the request of the provincial and federal governments. The environmental audit reported contamination of soil and/or groundwater at 27 of the 28 sites sampled by the Royal Commission and/or others. The MOEE's current cleanup guidelines are exceeded for a number of heavy metals, and benzene, ethylbenzene, toluene, xylene, PAHs, and PCBs are present at some sites. The soils contain a wide range of heavy metals, including cadmium, lead, arsenic, mercury, antimony, chromium, and molybdenum. At some sites, organic vapour concentrations have been found to occur at levels that indicate an explosion hazard.

At some locations groundwater is contaminated with heavy metals, organic compounds, and free-phase floating petroleum products. Groundwater analyses show that phenols are ubiquitous across the study area. As part of the environmental audit of the East Bayfront/Port Industrial Area, estimates of contaminant loadings to the harbour from groundwater were calculated for eight

parameters. These estimates were calculated recognizing that seasonal fluctuations in lake levels may cause reversals in groundwater flow directions in the study area. Annual maximum loading of heavy metals from four sites investigated varied from approximately 1 to 7 grams. Phenol loadings from two sites ranged from 0.4 to 1.6 grams per year. Annual loadings for PAHs measured at one site ranged from 0.5 grams to fluorene and phenanthrene to 5 grams for naphthalene. It should be noted that these calculations were based on a single set of water quality sampling and water level monitoring.

The extensive investigations carried out by the City of Toronto on the 80-acre Ataratiri site indicated that soil quality over about half of the area does not meet current MOEE guidelines for residential, commercial or industrial uses. About 41% of the fill exceeds industrial guideline concentrations for one or more contaminants, 12% is between residential and industrial guidelines and 14% of the fill is below the guidelines. Another 33% of the area is untested due to its inaccessibility.

The contaminants of concern at Ataratiri have been grouped into 3 categories: metals, PAHs and PCBs. Metal contamination is generally limited to the top 1 to 1.5 m of fill. The distribution of PCBs at Ataratiri is evidently limited to isolated areas associated with scrap yard operations. The highest levels of PAH contamination occur in the western part of the Ataratiri site where a coal gasification plant operated until the early 1960's. The cleanest soil on the Ataratiri site is located in the centre of the area where rail related activities have been located.

Groundwater samples have been collected from some 40 places in the overburden and 6 locations in the bedrock. Analyses for metals and organic compounds indicated significant contamination of groundwater in the area of the former coal gasification plant and the south-east corner of the site. Isolated occurrences of groundwater contamination have been detected in scrap yards and where there has been localized leakage from underground tanks. Cyanide, linked to coal gasification plant activities and hydrocarbons associated with a variety of sources are the main contaminants detected in the groundwater at Ataratiri.

There remain significant gaps in our understanding of the soil and groundwater conditions in the Lower Don Lands, gaps that will require attention before regeneration can be fully achieved. In addition, the heterogeneous and unpredictable nature of the substrate and its contaminant characteristics presents a situation where uncertainty about the nature and extent of contamination will likely remain until remedial action is undertaken.

Ecosystem Health

The environmental audit of the East Bayfront/Port Industrial Area showed that transfers of contaminants are likely taking place in the soils and groundwater in this area, with the contaminants adsorbed to soil particles slowly moving into groundwater, and migration of contaminated groundwater between sites. It is likely that pollutants are also moving out of the soils and groundwater as the result of four processes: ingestion or uptake by terrestrial plants and animals; volatilization to air; resuspension of dust; and movement of groundwater to surface waters.

There is little information about the effects of toxic chemicals on wildlife or humans in the Lower Don Lands. Nevertheless, the potential pathways that could expose humans in the study area to pollutants are :

- breathing the air,
- contact with surface water through recreational activities,
- contact with soils during remediation or redevelopment,
- eating food grown on contaminated soils, and
- eating fish caught in the area.

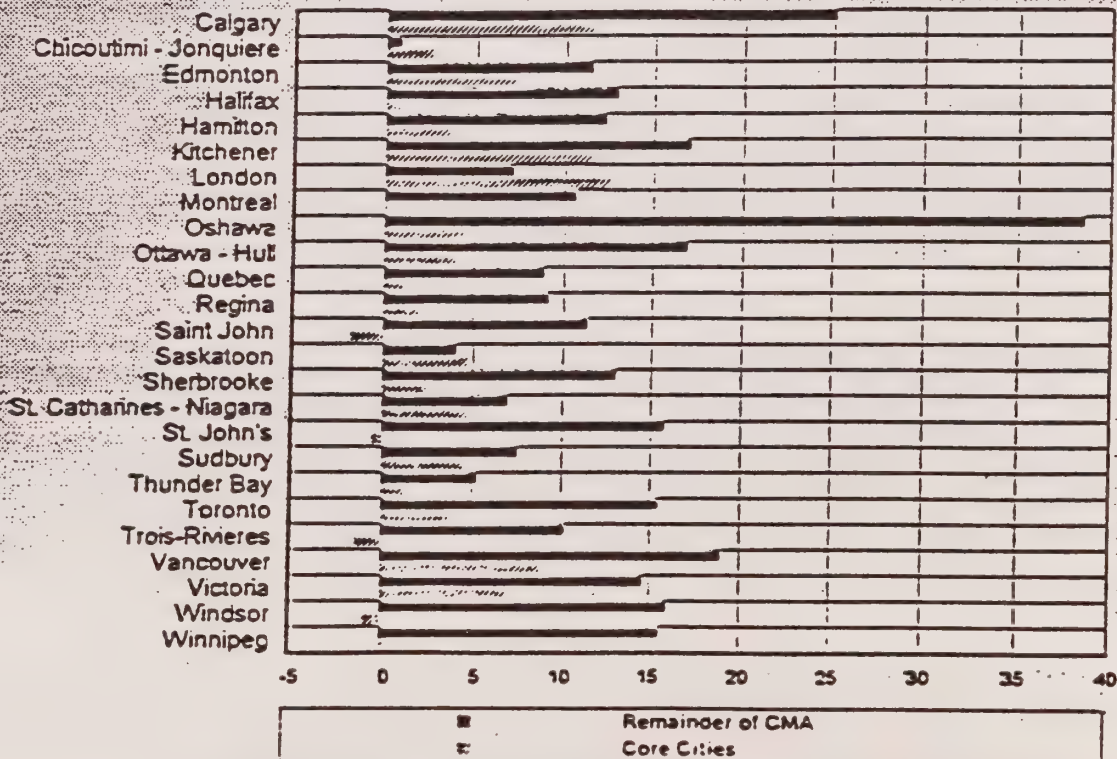
Volatilization to air and resuspension of dust are likely to be important exposure pathways, especially during cleanup and/or redevelopment when high volumes of soil will be exposed.

THE SUSTAINABLE CITY

The Lower Don Lands provide an opportunity to demonstrate ways of developing more sustainable cities. The concept of sustainability requires, at a minimum, that goals be based on the community's long-term interests, its economy, and the environment that supports them. To achieve this, it is necessary to consider the city, the suburbs, and the countryside, and the connections among them, within a regional context.

Growth of the Canadian Metropolis, 1986-1991

Percentage Change in Core City vs. Remainder of Metropolis



Data Source: Statistics Canada, Catalogues no. 93-303 and 93-304

In Ontario, as in the rest of Canada, most population growth over the last twenty years has taken place at the urban fringe. In the last 10 years this suburban growth rate has been very high; in most of the 25 census metropolitan areas, urban fringe growth has been two to ten times higher than the growth in urban cores. In Ontario, the highest growth rates have been in smaller cities and towns like Brampton, Oakville, Vaughan, Markham, Kanata, and Aurora.

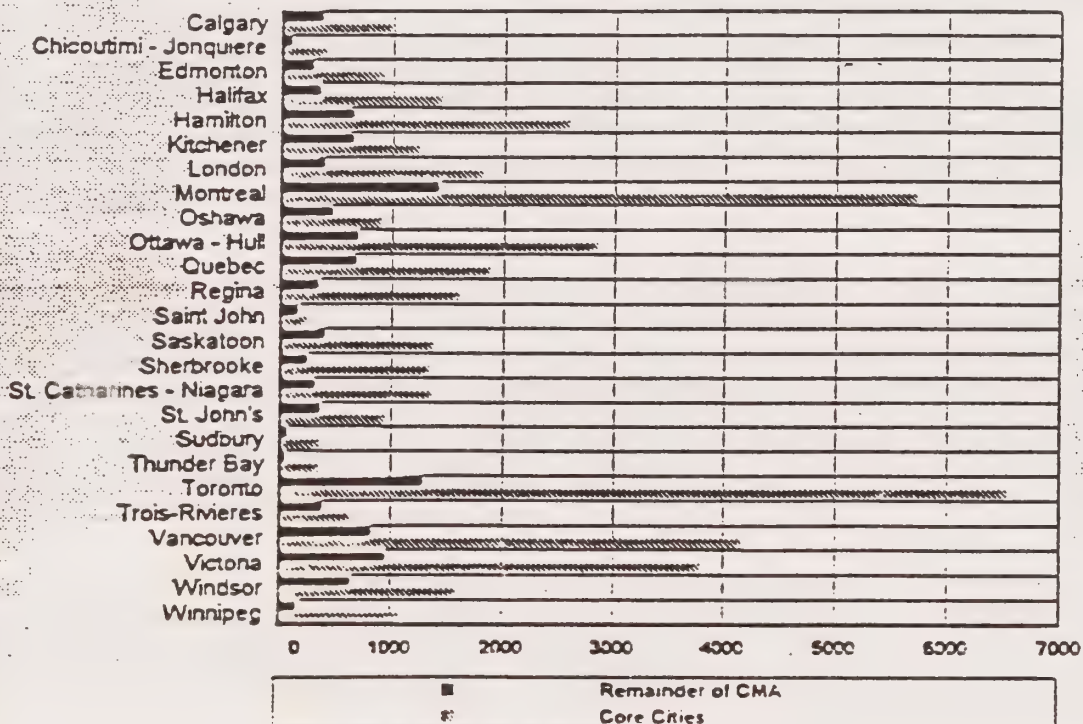
Development to accommodate growth at the urban fringe has been typified by large tracts of low density, single-use developments over what was often prime agricultural land. The consequences of this type of growth, including the loss of prime agricultural land, increased auto dependent transportation, lengthy commuter travel times, declining transit ridership, increasing infrastructure costs, and environmental deterioration, have caused many to label it as an unsustainable form of urban development.

The government of Ontario is promoting the control of urban sprawl through intensification policies including the *Land Use Planning for Housing Policy Statement* and the *Growth and Settlement Policy Guidelines*.

In the Greater Toronto Area (GTA) case, sprawl development has dominated for the past twenty years. In response, the Province (through the Office of the Greater Toronto Area) has lead a substantial research and consultation process, attempting to reach a consensus on the nature and future of development in the region. As part of that process, in 1990 the consulting firm, IBI Group, developed three scenarios for future development: Spread, Nodal and Concentration.

Canadian Metropolitan Densities

Persons per square kilometre in 1991



Data Source: Statistics Canada, Catalogue no. 95-303

Currently, the GTA has a population of 4.1 million. The IBI Group projected that the population of the GTA would climb to 6.02 million by the year 2021. Under the Spread scenario, which means continued sprawl, another 90,400 hectares of land would be required for new development. This represents a 52 per cent increase in land consumption compared to that which is currently developed. Under the Concentration Scenario, which would focus much redevelopment in Metro, the increase would be 20 per cent over the current use. Recent projections based on the 1991 census suggest that the GTA will have a population of 7 million or more in 2021 rather than the 6.02 million projected by the IBI Group.

The scenario that has found most favour with politicians and planners is the Nodal scenario in which growth is limited to the urban envelope. Under the Nodal scenario, the City of Toronto's population is projected to increase by 160,000 or 26 per cent. The number of dwelling units may well have to increase by over 26 per cent if household size continues to decrease. A major challenge now is to work out where in the City of Toronto these new housing units might be built - approximately 120,000 in total under the Nodal scenario, 80,000 for the increased population and 40,000 for the general decrease in household size.

One of the ways to accomplish a Nodal growth pattern is to redevelop vacant sites located within the urban envelope. Such sites offer economic and practical advantages because of their accessibility to existing infrastructure, services and activities. The size of the Lower Don Lands, their proximity to the heart of the city, and their prime waterfront location, provide a significant opportunity for mixed use redevelopment - but only if environmentally responsible, cost-effective responses to soil and groundwater conditions can be found quickly.

ONTARIO'S SITE REMEDIATION APPROACH

Legislative Framework

Decommissioning and remediation of contaminated sites is not explicitly required in any Ontario legislation. Nor does any legislative provision or regulation set out standards for these activities. There are, however, provisions in a number of statutes that allow the Ministry of the Environment and Energy (MOEE) to recommend site remediation as part of another legal process or require it, in the form of an Director's Order, in response to a situation that is harming or may harm the environment.

If a project is subject to the Environmental Assessment Act, the MOEE may recommend conditions requiring cleanup be attached to the approval or exemption order of the project. The land use planning process (Planning Act) may also include site remediation requirements. For example, MOEE may be asked by a municipality or the Ministry of Municipal Affairs to comment upon a proposal that involves a change in land use or an amendment to a municipal plan. MOEE's recommendation for cleanup may then become a condition of the approval of the land use change or plan amendment. Some conservation authorities and federal agencies may also ask MOEE to comment upon the environmental suitability of projects and applications.

Pursuant to the Environmental Protection Act, an MOEE Director can issue a number of orders, including control orders, remedial orders and orders to take preventative measures. Despite the wide discretion of the Director to issue an order, decisions in Ontario courts have had the effect of limiting the use of orders to situations where there is an off-site impact beyond property boundaries or effects on air quality.

Decommissioning and Cleanup Guidelines

In Ontario remedial action is guided by the MOEE's "Guidelines for the Decommissioning and Cleanup of Sites in Ontario (1989)". The Guidelines indicate that cleanup should be undertaken wherever contaminants exist at concentrations above background levels. Proponents are permitted, however, to develop criteria above background levels that are protective of "human health and the environment."

The proponent may follow one or more of three courses set out in the Guidelines: i) apply relevant MOEE policies and guidelines; ii) apply cleanup criteria from other jurisdictions; and iii) develop and apply site-specific criteria. The three options are listed in order of decreasing preference according to the MOEE. The onus is on the proponent in the latter two cases to provide MOEE with the information necessary to allow MOEE to make a decision regarding the acceptability of the proposed criteria.

If the first option, application of relevant MOEE policies and guidelines, is selected, the proponent must clean the soil to the levels set by MOEE for 22 parameters. The cleanup levels set for these parameters vary with the land use anticipated for the site. Five broad categories of land use are considered: agricultural, residential, parkland, commercial and industrial; requirements for the first three uses are more stringent than for the latter two uses. Of the 22 parameters, 17 are metals and 5 are contaminant indicators (pH, electrical conductivity, sodium adsorption ratio, % N, and % oil and grease). Many of the parameter levels were established using "professional judgement" based on phytotoxicological considerations. While the Guidelines do not address specific organic compounds, MOEE has adopted interim guidelines for PCBs, dioxans and furans. Finally, the Guidelines include aesthetic considerations based upon qualities such as appearance and odour.

Remediation of air and groundwater is not addressed in the Guidelines; rather, reference is made to other provincial regulatory instruments regarding air and groundwater. Cleanup of groundwater may be guided by a number of MOEE policies and guidelines ("Water Management: Goals, Policies, Objectives and Implementation Procedures for the MOE", "The Incorporation of the Reasonable Use Concept into the Groundwater Management Activities of the MOE", and "The Resolution of Groundwater Quality Interference Problems"), appropriate sewer use by-laws, and Provincial Water Quality Objectives / Guidelines. Air quality in Ontario is governed by Regulation 308 of the EPA. Specific air quality criteria are set out in Schedule 1 of the regulation, and are based on the "point of impingement" approach.

Some Key Regulatory Issues:

The current Guidelines are recognized by many parties, including MOEE and other public agencies, the legal, financial and development sectors, and public interest groups, as being an impediment to the regeneration of contaminated urban lands. In many cases, the process and requirements of the Guidelines render cleanup cost prohibitive, deter investment in remediation and associated technologies, and raise concerns about environmental liability.

Revision of the Guidelines, currently under way by the MOEE, is addressing the following key issues:

Approach to Cleanup

As described above, proponents can adhere to MOEE's generic guidelines, can develop site-specific criteria, or can do both. Would cleanup be facilitated by a different approach to cleanup? Several options could be considered, with the two poles being generic, universally-applied MOEE guidelines and proponent-driven, site-specific guidelines. The current approach favours the use of generic guidelines. Would proponents be more likely to undertake site remediation if the Guideline made it less onerous to develop site-specific criteria? Is it appropriate to permit proponents to "regulate" themselves in this manner? There are also resource constraints to consider -- for example, would MOEE experience a dramatic workload increase if site-specific criteria had to be reviewed for every cleanup project (particularly if risk assessment techniques are used)? Administrative backlog at MOEE could delay redevelopment, defeating the purpose of providing more flexibility to proponents. It is imperative that a cleanup approach be developed that provides for human health and environmental protection, promotes flexibility for proponents and does not unduly strain government resources.

Depth of cleanup

In practice, the cleanup levels in the Guidelines have been applied by MOEE to the lowest depth at which contaminants are present, even to bedrock. In other words, all the soil must be cleaned to the Guideline level for each parameter, regardless of the actual potential for migration of contaminants and effects on receptors. Rigid application of this standard renders cleanup of sites cost prohibitive in many instances.

The cost of this approach and its lack of scientific rationale has led MOEE to consider a fundamental question: Can soil of a quality poorer than current Guideline criteria be left behind at depth? While many issues and conditions associated with the principle of leaving some contaminants at depth need to be addressed, the Ministry has answered a provisional "yes" to this question. The problem is to now implement the principle. How does one define "at depth" and "surface"? It has been agreed that in leaving contamination at depth, exposure pathways to receptors must be reduced to acceptable levels or blocked. Aside from engineered solutions, means of accomplishing this include varying depth and/or cleanup levels with the anticipated future land use.

Guideline cleanup levels

The existing 22 cleanup levels lack a defensible scientific rationale. The levels reflect decisions by MOEE staff on the basis of "professional judgement", and are not empirically-derived background levels or effects-based values. MOEE has recognized this concern, and is currently considering alternative sources of new cleanup numbers.

MOEE also recognizes the need to increase the number of chemical parameters in the Guidelines, particularly for organic contaminants. The existing Guidelines do not describe a protocol for the addition of new cleanup parameters and levels. Hence MOEE must either develop a protocol or adopt a protocol from another jurisdiction (eg. the Canadian Council of Ministers of the Environment (CCME) protocol).

Any new cleanup levels should be consistent with the standards and requirements of other regulatory instruments (eg. MOEE's proposed Materials Management Policy for handling excess soil, rock and similar materials) in order to reduce uncertainty about liability and to ensure that no real or perceived inequities occur.

Responses to contamination

Currently, the most common method of restoring a contaminated site to a useable state is to excavate and dispose of the contaminated material off-site. While this is currently among the least expensive of the options, the problem is not solved but only transferred elsewhere (see page 13).

The current Guidelines do not encourage development and implementation of alternative techniques for remediating contaminated material on-site. Uncertainty, associated with a number of shortcomings of the Guidelines, including their lack of legal status, their incomplete and vague nature, and the fear of changing cleanup standards and requirements, has discouraged investment in promising technologies. This uncertainty coupled with a lengthy and expensive approvals process has stifled the emergence of alternatives to excavation and disposal of contaminated soil.

Classification of remediated soil

Remediated soil is often considered a "waste" under the EPA. At present, according to the EPA, waste must be disposed of only in approved waste disposal sites. Hence, on-site remediation requires approval of an on-site waste treatment sites (processing sites) and approval of the site itself as a waste disposal site. Under the EPA, waste disposal sites must remain inactive for 25 years unless the Minister approves of a use proposed for the site. Clearly, there needs to be a legal mechanism for reclassifying decontaminated soil to non-waste status. This may involve tailoring Certificates of Approval to immediately reclassify soil once decontaminated. Revised Guidelines could also address this issue.

Registration

The Guidelines indicate that if soil is not cleaned to background levels, the residual contaminants should be registered on the property title. However, there is no statutory requirement that contaminants be registered; a Director's order under the EPA is required to ensure registration. Hence, there is no mechanism to ensure that records of contamination are kept in all cases. Registration on title may not be the optimum means of recording residual contamination, due to liability concerns. On the other hand, concerns about liability on the part of lenders, trustees and receivers, and concerns about the health of future site users, would suggest that some form of record keeping is necessary.

REMEDATION REQUIREMENTS: OPTIONS FOR A PRACTICAL, RESPONSIBLE CLEANUP APPROACH

Keeping in mind the objectives of healthy cities and sustainable land use, and the problems with the existing regulatory regime, the Lower Don Lands represent a unique opportunity to formulate and adopt a new, practical and responsible approach to cleanup of contaminated lands. In

embarking on such a venture, it is important to agree upon guiding principles. Listed below are 4 principles that have been developed by the Trust's Site Remediation Work Group to guide the preparation of a site remediation strategy for the Lower Don Lands:

1. Reuse of land in the Lower Don Lands should occur such that soil and groundwater quality do not present unacceptable risks to future site users and where the health of the ecosystem (including off-site health and safety) is not compromised by migration of contaminants.
2. The site remediation strategy should ensure that potential effects of the transfer of contaminants to other parts of the ecosystem and to other locations is minimized.
3. Remediation options that provide for appropriate cleanup and recycling should be favoured over disposal as wastes.
4. The use of cost-effective cleanup technologies and other land management options protective of human health and the environment should be supported.

Within the context provided by these 4 principles, it will be necessary to address the regulatory, technical and liability issues outlined in this paper in a new cleanup approach. To focus discussion, five of the most frequently discussed approaches are outlined below.

1. Status quo

The status quo requires cleanup to background levels, or, upon the initiative of the proponent, to a level above background levels but which is protective of human health and the environment. Cleanup to levels above background concentrations varies with land use. Residential, agricultural and parkland uses demand higher cleanup levels than industrial and commercial uses. Depth of cleanup is not considered; cleanup of material that exceeds the guidelines is required to bedrock. This approach and its limitations were detailed above.

2. Surface cleaned to one (residential) standard

This model would require the surface of the soil (eg. top metre) to be cleaned to the residential / parkland standard, however defined (whether using current numbers, CCME numbers, or new MOEE effects-based numbers), regardless of the actual use of the land.

Below the surficial layer, two options would be possible. First, generic MOEE numbers or site-specific numbers could be used to determine the level of cleanup to bedrock, the level being something less than residential/parkland. Alternatively, cleanup at depth could be made necessary only to the extent needed to prevent adverse effects on groundwater, surface water, and volatilization to the surface. Where no groundwater or mobility concerns were present, no cleanup below the surficial metre would be needed.

3. Surface cleaned to standard dependant on land use

Rather than requiring remediation of the surface to residential standards in all cases, a new approach could involve cleanup of the surface to a level dependant on the land use. The existing land use categories could be maintained. Cleanup at depth could follow one of the two options identified above: either to a level less than the surficial standard, or only in cases of groundwater or mobility concerns.

4. One cleanup standard, varying depth

The previous two approaches envision a surficial layer of a fixed thickness, cleaned to a set standard. Another means of reducing exposure to acceptable levels, or blocking exposure, is to vary the depth to which certain cleanup criteria are applied. Using this approach, one could require cleanup to residential/parkland standards at the surface in all cases regardless of land use. What would vary is the definition of "surface" -- perhaps one metre for residential uses of the land and half a metre for industrial uses of the land. Consideration of contamination at depth (below "surface") could follow the two options outlined in 2.

5. Soil accessibility and potential exposure

The approaches suggested above at 2, 3 and 4 would be designed to accomplish one key task: reduce exposure of receptors to contaminants to pre-determined acceptable levels, while minimizing the amount of material to be treated or handled. Consideration of exposure is implicit in land use and cleanup depth variations. Cleanup levels are determined by an evaluation of the scientific literature concerning human health and environmental impacts and the potential for exposure to contaminants in soil and groundwater.

In some jurisdictions recent regulatory development focuses on the use of effects-based criteria and cleanup requirements are directly linked to exposure. For example, the State of Massachusetts has developed an approach that is based on classification of soil accessibility and potential human (child & adult) exposure. Each exposure scenario would be compared to a matrix of soil accessibility versus human exposure potential to determine the appropriate level of cleanup.

Like Ontario, Massachusetts has considered the strengths and weaknesses of setting generic cleanup standards (using risk assessment techniques) for each exposure class versus allowing proponents to prepare risk assessments for each site. The Massachusetts proposed regulation provides for three cleanup approaches: application of generic (risk-based) criteria; modification of the generic approach using contaminant fate modelling; and site-specific risk assessment.

RESPONSES TO CONTAMINATION

Potential responses to contamination in the Lower Don Lands include:

1. No Action
2. Containment
3. Excavation and disposal off-site
4. Excavation and treatment off-site
5. Excavation and treatment on-site
6. Treatment in-situ
7. Combinations of 1-6

In most cases it will be necessary to link two or more of these responses together in a treatment system to effectively treat soils and groundwater in the Lower Don Lands. Many of the technologies and other management responses appropriate for the conditions found in the Lower Don Lands are available in Canada (see Table 1). However, field scale testing of most of the promising technologies has not yet been completed. At the present time there are only a few technologies that hold certificates of approval for operation in Ontario. The costs and time

associated with the development and approval of site remediation technologies is recognized as a deterrent to the use of on-site cleanup approaches. It is recognized that treatability testing will be required prior to the selection of appropriate cleanup technologies, and the Port Industrial District has been cited as an ideal location to demonstrate such remedial technologies.

1. No Action

The no action option relies on natural processes to reduce contaminant concentrations to acceptable levels. Natural regeneration is already occurring at some sites in the Lower Don Lands, for example, along the North Shore of the Outer Harbour. This strategy could require on-going monitoring of soil and groundwater quality at some sites, and if used as the only response, could take considerably longer than other strategies. The no treatment option could represent substantial cost advantages at some sites.

2. Containment

Containment involves the use of barriers to limit the infiltration of water onto a site and the flow of groundwater and dissolved contaminants away from the site. Containment typically requires that the soil surface permeability be reduced by paving, capping with clay, or by installing a synthetic membrane.

Limiting groundwater flow off-site usually requires hydraulic control through the use of pumping wells or cutoff trenches. Vertical barriers, such as sheet piling, slurry walls and grout curtains can also be installed to prevent off-site movement of groundwater.

3. Excavation and Disposal Off-site

Excavation and disposal off-site in Ontario and/or U.S. landfill sites requires classification of the solid waste material under the Ontario Environmental Protection Act, Regulation 309.

At the present time a significant cost advantage exists for the off-site disposal option (as low as \$40 per tonne for non-hazardous material); however, this approach does not treat contaminated material but transfers the problem to another jurisdiction and/or part of the ecosystem. Liability is usually not transferred. It also puts a significant strain on landfill capacity and works against the development of viable, cost-effective site remediation technologies.

4. Excavation and Treatment Off-site

A fixed treatment centre is established to receive, treat and recycle contaminated soil. The Soil Recycling Demonstration Project carried out by the Toronto Harbour Commissioners is a recent example of this approach. A soil treatment facility located in the Lower Don Lands could remediate soils from across the area and anchor development of soil cleaning expertise and technology that could be used and exported elsewhere.

5. Excavation and Treatment On-site

Treatment of contaminated soil and groundwater takes place in the location where the contamination exists, and operating conditions of the technology could be optimized for the specific waste feed characteristics of the site. Conditions within the upper portion of the soil profile indicate that treatment of contaminated soils using on-site mobile treatment technologies could be feasible at many sites in the Lower Don Lands.

6. In-situ Treatment

For some situations a preferred response to contamination could be the application of in-situ treatment technologies whereby soil and/or groundwater are not excavated prior to treatment. This approach could have particular merit for the treatment of certain hydrocarbon-contaminated areas.

Promising Technologies

Soil washing and volatile organic desorption are often used for treatment of organic contamination. Metal extraction and stabilization are commonly used for treatment of inorganic contaminants. Costs range in the order of \$50 to \$500 per tonne for organic treatment and \$80 to \$250 per tonne for inorganic treatment. High temperature incineration costs can range from \$900 to \$1500 per tonne.

A technology screening process was undertaken by the City of Toronto in 1990 to identify promising types of technologies to respond to the conditions found at Ataratiri. Those identified as worthy of further study are listed below for soil and groundwater.

Soils

Organic Contaminants Only:	Bioremediation (<i>in situ</i> and <i>ex situ</i>) Storage
Inorganic Contaminants Only:	Metal chelation
Organic and Inorganic Contaminants:	Off-site disposal Soil washing Physical/chemical solidification and stabilization Microencapsulation Reuse On-situ isolation Planning considerations

Groundwater

Organic contaminants only:	Air stripping Bioremediation (<i>in situ</i> and <i>ex situ</i>) Carbon adsorption Free product recovery
Inorganic contaminants only:	Chemical addition
Organic and inorganic contaminants:	Off-site disposal On-site management Physical separation Chemical oxidation Permeable barriers

In addition, low temperature thermal desorption is currently in use at the Keele Valley landfill facility for the treatment of hydrocarbon-contaminated soils.

Criteria for Evaluation of Responses to Contamination

Many technologies and other responses to soil and groundwater contamination have not yet been commercially proven. The evaluation of potential technological and other responses to contamination must ensure that proposed solutions are sound from human and environmental health, legal and economic perspectives. This challenge can be at least partially addressed by the use of appropriate evaluation criteria. Evaluation criteria considered by the City of Toronto's Environmental Protection Office include (City of Toronto Department of Public Health, 1991):

Destruction Efficiency
Transport of Hazardous Materials
Removal Efficiency
Completion Time
Worker/Community Exposure
Community Disturbance
Stage of Development
Cost

Transport of Heavy Equipment
Waste Applicability
Fire/Explosion Hazards
Residue Toxicity
Process Emissions
Residue Mobility
Independent Technology Evaluations

Additional criteria could include:

Potential for transfer of contaminant(s) to other parts of the ecosystem
Permanency
Need for monitoring

ENVIRONMENTAL LIABILITY AND FINANCIAL CONCERNS

There are a number of issues involving liability for contaminated sites that will need to be addressed in the preparation of the Lower Don Lands site remediation strategy. These include:

The Liability of Lenders

The potential liability of lenders for the cost of cleaning up contaminated sites has had the effect of making capital, which is essential for the regeneration of areas such as the Lower Don Lands, less available in environmentally risky situations. Lenders may face risks in a variety of ways:

- if they have (or had) charge, management or control of the source of the contaminants (eg. in their capacity as property or business managers or tenants), lenders may be directly liable for cleanup costs;
- site contamination may have such a negative effect on security pledged against a loan that the likelihood of recovering loans through the sale of assets is diminished;
- the cost of cleanup may severely affect a company's cash flow, to the point of loan defaults or bankruptcy, forcing lenders into foreclosures and other loan recovery measures;
- indirectly through their agents and receivers and trustees.

In order to ensure a more available flow of capital to those businesses and ventures that are necessary to the regeneration of the Lower Don Lands, lenders may need some form of assurance that their liability will be minimized. This means that given the real or perceived environmental risks associated with the Lower Don Lands, transaction costs in doing business may be somewhat higher to cover those risks (eg. a risk premium on a loan; contribution to an insurance fund).

A number of questions arise:

- What is the appropriate level of risk for lenders given the potential return on business in the area?
- How can lenders protect themselves against changing environmental standards and cleanup requirements?
- What information should be made available to lenders, and what steps should lenders be expected to take in assessing their risks?

What should the extent of liability be, and how should costs be allocated? Should the claims of secured creditors rank ahead of environmental obligations resulting from the operations of the borrowers?

The Liability of Other Parties

Any past or present owner or occupant, or person has or had charge, management or control of the source of a contaminant, or who causes or permits discharge may be liable for the cleanup of a contaminated site. Problems arise when these parties are not in a position to fund remediation. Who should bear the costs in such cases? Should any groups be exempted from liability or benefit from limited liability (eg. contaminant transporters, trustees in bankruptcy). Should "polluter pays" or "beneficiary pays" or some combination be the driving principle in addressing such questions?

An issue related to the question of who should pay is, by what means? If some parties are to be exempt from direct and full liability for cleanup, should they otherwise help pay cleanup costs in the form of contributions to a cleanup fund (eg. through lump sum payments, loan surcharges, a share of proceeds from asset sales)? Other mechanisms can be anticipated to help parties defray cleanup costs, such as requiring borrowers to purchase environmental liability insurance, or levying surcharges on general liability insurance policies held by industrial and service firms for dedication to cleanup funds. Is earmarking general taxation revenues for cleanup fair, given that all taxpayers may have benefitted from that activity which caused the contamination? Clearly, creative financial solutions to liability questions that are equitable to all parties will be needed to ensure timely economic and environmental restoration of the Lower Don Lands.

APPENDIX 2

List of Registrants

LIST OF REGISTRANTS

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DER MAGISTRAT Dezernatsamt Planung

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APPENDIX 3

British Columbia Bill 26, Waste Management Amendment Act: An Overview

Contaminated Sites Legislation – An Overview –

Contaminated sites legislation has been introduced in the British Columbia legislature. When proclaimed, *Bill 26 - 1993, Waste Management Amendment Act, 1993* will implement the 'polluter pays' principle for managing contaminated sites.

The purpose of this document is to provide an overview of the entire bill. A detailed examination of the bill is recommended. Background reports are available to provide further information on specific topics of particular interest.

What are the Objectives of the Bill?

The current *Waste Management Act* has limited provisions regarding technical requirements or procedures for managing contaminated sites. The amendment is intended to set out requirements and provide greater certainty of process. In addition, it defines more clearly and more fairly who is responsible for costs of any needed remediation.

Historical contamination of land, groundwater and even sediments below the water surface can now be addressed more directly. A comprehensive regulatory system will be established. The legislation, and the regulations being developed, will address all stages of management from site identification through to monitoring remediation performance.

Remediation of contamination can often be carried out concurrent with redevelopment of industrial properties. Contaminated sites legislation seeks to coordinate regulatory activities, not duplicate them. Opportunities are created to delegate regulatory functions to municipalities or to other ministries. Roles of the province and of municipalities are defined.

A Word About Regulations Being Developed

Legislation in British Columbia typically provides a regulatory framework and leaves specifying certain technical and procedural details to regulations. The proposed contaminated sites amendment to the *Waste Management Act* follows this pattern. Regulations will be developed to more clearly define implementation of the features of the legislation (S. 35.1(1)). A commitment has been made by the Ministry of Environment, Lands and Parks to consult widely in developing the regulations. Very important input is expected from those who will administer, or be guided or affected by the regulations. The Waste Reduction Commissioner will assist the ministry in this consultation process. Only when regulations are ready can the legislation be proclaimed and take effect. The earliest likely date for proclamation is January 1994.

Other Provinces and Territories in Canada

Effective management of contaminated sites is an issue not only in British Columbia, but in all other provinces and the territories as well. For example, in 1992 Alberta passed its *Environmental Protection and Enhancement Act* which included provisions for contaminated sites. Ontario already has strong liability provisions and is further reviewing its legislation. Other provinces are proposing to amend or develop new legislation shortly. Under the auspices of the Canadian Council of Ministers of the Environment (CCME) the provinces and territories, along with Environment Canada, initiated the National Contaminated Sites Remediation Program in 1989. Implementing the 'polluter pays' principle is a basic tenet held by all jurisdictions.

Notable Special Features of the Proposed Legislation

Site Registry – A site registry is proposed (S. 20.21). Basic characteristics of a site, as well as milestones in the process of remediation (e.g. phases of investigation, remediation planning, regulatory agreements) will be recorded. The registry will also provide business information (e.g. for land transactions) and serve as a ready source of information for the general public. It is planned that access to the computerized site registry will be via an existing dial-up system such as *BC Online* or another similar facility.

Fees – Greater levels of involvement of BC Environment, municipalities or other ministries will be required for some aspects of the proposed regulatory system. Authority for collection of fees to offset costs of some of the regulatory functions is therefore provided in the bill (S. 35.1(1)(e)).

Alternate Dispute Resolution – Alternate dispute resolution mechanisms have been incorporated into Bill 26. Resolving responsibility and liability issues is often critical in contaminated site remediation. Potential for legal actions and suits exists. Early U.S. procedures under the Superfund program resulted in disproportionately high legal costs at major sites. Provision has therefore been made for an allocation panel (S. 20.51) accessible by both responsible parties and a Regional Environmental Protection Manager (the government official vested with authority for many regulatory actions).

Devolving Responsibility – Coordinating regulatory activities for contaminated sites with local development approvals where feasible is an objective of the legislation. Beyond structuring legislation to recognize current procedures and interface with them, provision has been made for delegation of many of the regulatory functions to municipalities (S. 20.91). Some municipalities will not wish to, or do not have the capability to administer the legislation and regulations. Delegation of authority will be by mutual agreement and will also allow municipalities to collect fees to offset costs.

Public Consultation and Review –

Concern is often high for potential environmental or health effects of contamination. Access to information and opportunity to review and comment on remediation plans for a site is important to many people. However, not all sites generate the same level of concern or pose the same hazards. Bill 26 gives opportunity for requiring public consultation or review of remediation plans (S. 20.7). Factors to be considered when deciding on required consultation are provided.

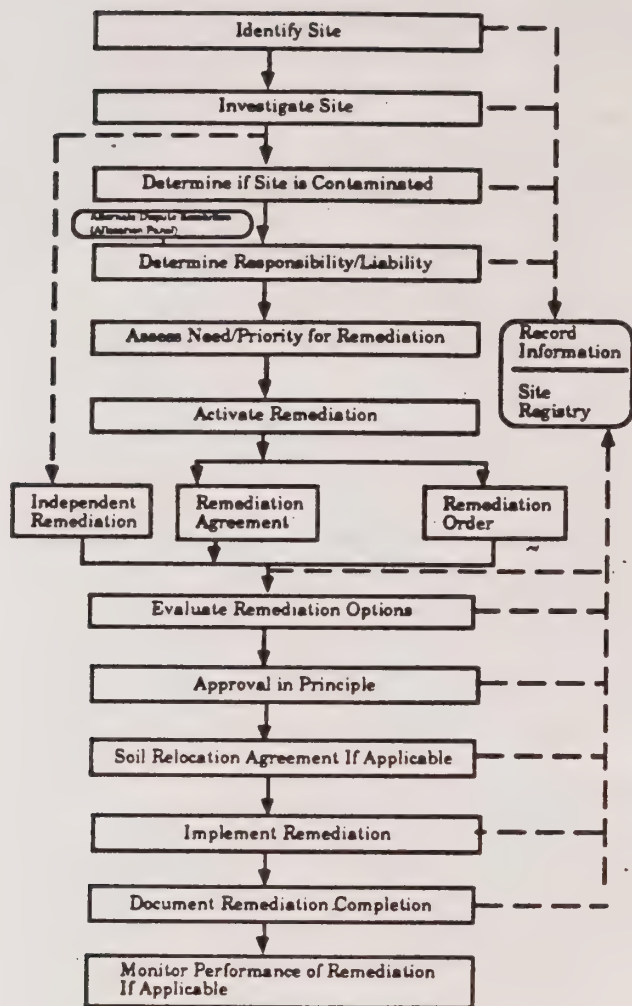
Independent Remediation Procedures – At many sites, responsibility for remediation costs is not in dispute. Remediation may be routine, methods of treatment are readily available, or with the assistance of capable engineering or environmental consultants a site can be remediated with very little involvement by a regulator. With requirements stated in regulations and with environmental responsibility or responsible care by site owners, independent action is possible.

Independent remediation procedures carried out in accordance with regulations are therefore allowed (S. 20.8) provided the ministry is notified both at the start and at completion of remediation. Notations will be entered in the site registry (S. 20.21(2)(d)).

Summary of Procedures and Related Provisions Proposed in Legislation

The following chart is a simplified representation of the regulatory and management process for a site. Not all steps pertain to all sites.

CONTAMINATED SITES REGULATION/MANAGEMENT
Generalized Scheme



The following provides annotations of the process.

Identifying Sites – A site profile will be required of various persons, for example: an applicant for municipal approvals (S. 20.11(1)); the owner of real property used for specific purposes or who dismantles structures/decommissions a site specified in regulations (S. 20.11(2)); a vendor of commercial or industrial land (S. 20.11(7)); or a person ordered to do so by a manager (S. 20.11(10)). A site profile will be evaluated in accordance with regulations either by an official in BC Environment or by an official of another ministry or a municipality. The evaluation will determine whether a site should be referred to a Regional Environmental Protection Manager. A site profile will contain readily

available information and should not require the assistance of a consultant to complete. A site profile will be an important mechanism for BC Environment to identify potentially contaminated sites.

Investigating Sites – A preliminary site investigation and a detailed site investigation may be required by a manager (S. 20.2). The requirement for investigations may be prompted by a site profile or other information a manager may have. A report of investigations will normally be information for determining whether a site is contaminated. It would also normally be the point at which independent remediation procedures (S. 20.8) are initiated.

Determining if a Site is Contaminated – Provision is made for a preliminary determination and final determination by a manager, with notification at each stage (S. 20.3). A determination is not required and lack of a determination does not mean a site is not contaminated. For example, independent remediation procedures may occur or a voluntary remediation agreement may be developed without a formal determination.

Determining Responsibility and Liability – Responsibility for remediation is stated very broadly in the current *Waste Management Act*, Sec. 22. Authority of a Regional Environmental Protection Manager to order investigations and cleanup is wide. Ability to predict responsibility based on the Act is poor. This proposed legislation will bring much greater clarity and predictability. Business planning should therefore be facilitated.

Bill 26 first casts a relatively "broad net" of liability (S. 20.31). Persons potentially responsible, for example, may include current or past owners of a contaminated site or a site from which contamination migrated. Persons potentially responsible may also include producers or transporters of contaminating substances.

To focus liability in order to achieve fairness and to implement the 'polluter pays' principle, Bill 26 immediately indicates conditions under which persons potentially responsible for remediation would not be liable (S. 20.4). Examples of situations or conditions where exemptions may apply include:

- contamination caused by acts of God or of war, or by a third person as indicated;
- innocent owners, operators or transporters as defined;
- a government body involuntarily acquiring ownership;
- a person whose site is contaminated only by migration from another site; and
- a secured creditor who does not act in any way so as to cause or increase contamination, encourage, suggest or consent to actions causing contamination, or take actions which would limit remediation (S. 20.4(1)(l) and 20.4(3)).

Qualifications for minor contributor status and authority of a manager to grant such status is provided (S. 20.6). Such status provides opportunity to limit liability and bring further fairness. Additional liability provisions are stated in relation to authority for remediation orders (S. 20.5).

General liability principles are stated. A person who is responsible for remediation is absolutely, retroactively and jointly and severally liable (S.20.41(1)). These general principles of liability are already in place in the *Waste Management Act*, Sec. 22 (pollution abatement order powers). Costs of remediation are defined (S.20.41(2)), and the effects on liability of previous legislation or authorizations for discharges are stated (S. 20.41(3)).

Assessing Need/Priority for Remediation

– Authority and guidance is provided for determining need and priority for remediation when a manager is considering an order (S.20.5(3)). A manager may also delay remediation for reasons of limited risk to health or the environment (S. 20.5(8) and S. 20.61(4)).

Activating Remediation – A voluntary remediation agreement or a remediation order can be used to document responsibility and to set out conditions required to address contamination.

A voluntary remediation agreement (S. 20.61) may be used where a person agrees to responsibility and remediation procedures. It may, for example, deal with such matters as:

- responsibility and contributions to remediation;
- information disclosure;

- financial guarantees;
- remediation schedules; and
- requirements to achieve satisfactory remediation.

A remediation order (S. 20.5) may be used where a person will not agree to responsibility or remediation requirements. A remediation order may deal with many of the same matters as a voluntary remediation agreement. A remediation order may take into account private agreements and name one or more persons (S.20.5(4)(a)(b)). A remediation order may effectively halt actions of a person who takes possession or control of real property until contamination has been addressed (S. 20.5(7)(9)).

Evaluate Remediation Options – Identification and investigation of a contaminated site (perhaps in several stages) may be followed by planning for remediation. Options for effecting remediation are usually several and one or a combination of several may be selected. Bill 26 provides explicitly for evaluating options (S. 20.9) and considering various stated factors, including:

- effects on human health and the environment;
- technical feasibility and risks; and
- remediation costs and economics.

A preference for permanent solutions to the maximum extent practicable is stated.

Approvals in Principle – Financing and municipal development approvals of sites with contamination can be significantly impeded without a clear process for dealing with contamination. A municipality or a lender may require assurance that a site has been adequately investigated and that acceptable plans have been developed for remediation. This certainty may be the critical element for financing and municipal approvals. Bill 26 proposes an optional **approval in principle** (S. 20.71(1)). All investigation results, evaluation of remediation options, public consultation input and remediation plans could be reviewed, and if satisfactory to a manager, could culminate in an approval in principle.

Contaminated Soil Relocation – Excavation at a contaminated site may be required to accommodate underground facilities for development. Relocating soil, either to a landfill, or for use as fill at another site may in some cases also

be an acceptable remediation option. Uncertainty often surrounds management of excavated soils. Appropriate controls are needed, including the application of standards. **Contaminated soil relocation agreements** are proposed (S. 20.81). These agreements, along with the indicated requirements for information on soil quality, environmental conditions at the deposit site etc., should provide for a more orderly process of managing soils from contaminated sites.

Implementing Remediation – Remediation is defined very broadly in Bill 26 to cover all stages of site management from preliminary investigations through to performance monitoring (S.1.). However, remediation is commonly viewed more narrowly as the removal or treatment required to clean up or secure a site to protect the environment, health or property values.

Physical action to remove, treat or secure contamination can proceed either as part of independent remediation procedures or after the regulatory steps described above, including issuing as applicable:

- a remediation order or a remediation agreement;
- an approval in principle; and
- a soil remediation agreement.

The proposed legislation provides a framework for two broad types of remediation methods. Contamination may be removed and/or treated so it no longer remains at a site. Regulations will provide standards for the quality of soils, groundwater etc. that may remain at a site when cleanup is considered complete. Alternatively, in some cases health risk assessment and environmental impact assessment may be used to document that under the specific proposed use, contamination may remain onsite, perhaps with additional protective measures installed.

Documenting Remediation Completion – Remediation completion documents are provided to accommodate the two broad types of remediation noted above. **Certificates of compliance** can be issued where numerical standards provided in regulations have been satisfactorily complied with at a site (S. 20.71(2)). **Conditional certificates of compliance** can be issued where risk-based standards and associated assessment procedures have been applied and are

satisfactorily complied with at a site (S. 20.71(3)). In both cases provision is made for the option of financial guarantee requirements. Notations on the site registry would be required indicating that certificates have been issued.

Confirmatory sampling and analysis to the satisfaction of BC Environment is normally required if a certificate of compliance is to be issued. Where contamination is managed onsite, certain conditions must be adhered to. These are necessary, for example, for:

- protection of the environment;
- protection of human health; or
- notification of future owners, operators or adjoining owners or operators.

Current practice requires that a restrictive covenant be registered on the property title. BC Environment believes that a conditional certificate of compliance will substitute in many cases for a restrictive covenant under S. 215 of the *Land Title Act*.

Other Provisions in Legislation

Several other provisions are made to complete the management of contaminated sites.

Declaration of Need for Remediation – Some sites may require prompt action if they pose a threat to human health or the environment. Bill 26 provides authority for the minister to declare the need for remediation at a high risk orphan site or another site (S. 20.92(2)). Where such a declaration has been made, authority is given for ordering labour, services, materials, equipment etc. and for entry onto and use of land. Funding provisions are made. Notation of a declaration will be entered on the site registry (S. 20.92(8)).

Cost Recovery for Government Action – Where the province must undertake remediation to ensure protection of human health or of the environment, a manager may seek cost recovery by several means (S. 20.93(1)):

- recovering costs from responsible persons directly;
- selling the property; or
- using cost-sharing agreements which may exist with other government bodies or persons.

The Canada-British Columbia high risk orphan site agreement in place until 1995 is an example of

a current source of possible cost-shared funds with another government body.

The procedure for recovery which is spelled out generally follows the model of the current *Environment Management Act*, but incorporates additional provisions:

- the amount expended is declared by the minister (S. 20.92(6)(7));
- the amount is recoverable in the Supreme Court or by order of the minister regarding funds from sale of property (S. 20.93(2)(7));
- a lien may be registered at the land title office for recovery of costs and this lien takes priority over all other liens (with specified exceptions) save those for wages due to workers by their employer and liens under section 52 of the *Workers Compensation Act* (S. 20.93(4)(5)(6)); and
- the Supreme Court can reduce or extinguish an amount that it considers excessive or unnecessary (S. 20.93(3)).

Immunity – Immunity is provided for regulatory actions undertaken except in bad faith (S. 20.94):

- for the minister, provincial officials or municipal officials arising out of administration of powers, duties and functions under Part 3.1 of the *Waste Management Act*,
- for a municipality and its officials relying on an approval in principle, a certificate of compliance or a conditional certificate of compliance; and
- for a municipality or its officials relying on an approval in principal or a certificate of compliance prepared by municipal officials under an agreement to delegate (S. 20.91).

Future Action – As is the case in most other jurisdictions, provision is made for 'reopening' the issue of remediation at a site. Regulations may address this further but conditions which might

compel such action, for example, include:

- additional information about a person's responsibility;
- a change in standards precipitated, for example, by new toxicity information;
- failure to exercise due care in management of contamination; or
- further contamination.

Revisions to Existing Sections of the *Waste Management Act*

Restraining Orders (S.24) – An order made relating to remediation under Part 3.1 is added to the existing authority for restraining orders.

Offences and Penalties (S. 34) – Failure to comply with requirements of various section of Part 3.1 are defined as offences and maximum penalties of \$200,000 are set.

Regulations (S.35) – A new S.35.1 is added which defines the authority to make regulations relating to contaminated site management.

Consequential Amendments

Consequential amendments to a number of statutes are made to enable actions provided for in the new Part 3.1. Included are amendments to the:

- *Islands Trust Act*;
- *Land Title Act*;
- *Mines Act*;
- *Municipal Act*;
- *Petroleum and Natural Gas Act*;
- *Property Law Act*; and
- *Vancouver Charter*.

May 19, 1993



Ministry of Environment,
Lands and Parks



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APPENDIX 4

Washington State Model Toxics Control Act

70.105.900 Short title—1985 c 448. This chapter shall be known and may be cited as the hazardous waste management act. [1985 c 448 § 16.]

Severability—1985 c 448: See note following RCW 70.105.005.

Chapter 70.105A

HAZARDOUS WASTE FEES

Sections

70.105A.035 Revision of fees to provide a waste reduction and recycling incentive.

Hazardous waste management: Chapter 70.105 RCW.

70.105A.035 Revision of fees to provide a waste reduction and recycling incentive. The legislature is encouraged to revise the hazardous waste fees prescribed in *RCW 70.105A.030 in a manner which provides an incentive for waste reduction and recycling. If prior to March 1, 1989, *RCW 70.105A.030 as it existed on August 1, 1987, has not been amended in a manner which specifically provides an incentive for hazardous waste reduction and recycling, then (1) the requirement to pay the fees prescribed in that section is eliminated solely for fees due and payable on June 30, 1989; and (2) the department of ecology shall prepare, and submit to the legislature by January 1, 1990, a proposed revision designed to provide an incentive for hazardous waste reduction and recycling. [1989 c 2 § 16 (Initiative Measure No. 97, approved November 8, 1988).]

*Reviser's note: RCW 70.105A.030 was repealed by 1990 c 114 § 21.

Short title—Captions—Construction—Existing agreements—Effective date—Severability—1989 c 2: See RCW 70.105D.900 through 70.105D.921, respectively.

Chapter 70.105D

HAZARDOUS WASTE CLEANUP—MODEL TOXICS CONTROL ACT

Sections

70.105D.010 Declaration of policy.
70.105D.020 Definitions.
70.105D.030 Department's powers and duties.
70.105D.040 Standard of liability.
70.105D.050 Enforcement.
70.105D.060 Timing of review.
70.105D.070 Toxics control accounts.
70.105D.900 Short title—1989 c 2.
70.105D.905 Captions—1989 c 2.
70.105D.910 Construction—1989 c 2.
70.105D.915 Existing agreements—1989 c 2.
70.105D.920 Effective date—1989 c 2.
70.105D.921 Severability—1989 c 2.

70.105D.010 Declaration of policy. (1) Each person has a fundamental and inalienable right to a healthful environment, and each person has a responsibility to preserve and enhance that right. The beneficial stewardship of the land, air, and waters of the state is a solemn obligation of the present generation for the benefit of future generations.

(2) A healthful environment is now threatened by the irresponsible use and disposal of hazardous substances. There are hundreds of hazardous waste sites in this state, and

more will be created if current waste practices continue. Hazardous waste sites threaten the state's water resources, including those used for public drinking water. Many of our municipal landfills are current or potential hazardous waste sites and present serious threats to human health and environment. The costs of eliminating these threats in many cases are beyond the financial means of our local governments and ratepayers. The main purpose of "this act" is to raise sufficient funds to clean up all hazardous waste sites and to prevent the creation of future hazards due to improper disposal of toxic wastes into the state's land and waters.

(3) Many farmers and small business owners who have followed the law with respect to their uses of pesticides and other chemicals nonetheless may face devastating economic consequences because their uses have contaminated the environment or the water supplies of their neighbors. With a source of funds, the state may assist these farmers and business owners, as well as those persons who sustain damages, such as the loss of their drinking water supplies, as a result of the contamination.

(4) Because it is often difficult or impossible to allocate responsibility among persons liable for hazardous waste sites and because it is essential that sites be cleaned up well and expeditiously, each responsible person should be liable jointly and severally. [1989 c 2 § 1 (Initiative Measure No. 97, approved November 8, 1988).]

*Reviser's note: For codification of "this act" [1989 c 2], see Codification Tables, Volume 0.

70.105D.020 Definitions. (1) "Department" means the department of ecology.

(2) "Director" means the director of ecology or the director's designee.

(3) "Facility" means (a) any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, vessel, or aircraft, or (b) any site or area where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed, or otherwise come to be located.

(4) "Federal cleanup law" means the federal comprehensive environmental response, compensation, and liability act of 1980, 42 U.S.C. Sec. 9601 et seq., as amended by Public Law 99-499.

(5) "Hazardous substance" means:

(a) Any dangerous or extremely hazardous waste as defined in RCW 70.105.010 (5) and (6), or any dangerous or extremely dangerous waste designated by rule pursuant to chapter 70.105 RCW;

(b) Any hazardous substance as defined in RCW 70.105.010(14) or any hazardous substance as defined by rule pursuant to chapter 70.105 RCW;

(c) Any substance that, on March 1, 1989, is a hazardous substance under section 101(14) of the federal cleanup law, 42 U.S.C. Sec. 9601(14);

(d) Petroleum or petroleum products; and

(e) Any substance or category of substances, including solid waste decomposition products, determined by the director by rule to present a threat to human health or the environment if released into the environment.

The term hazardous substance does not include any of the following when contained in an underground storage tank from which there is not a release: Crude oil or any fraction thereof or petroleum, if the tank is in compliance with all applicable federal, state, and local law.

(6) "Owner or operator" means:

(a) Any person with any ownership interest in the facility or who exercises any control over the facility; or

(b) In the case of an abandoned facility, any person who had owned, or operated, or exercised control over the facility any time before its abandonment;

The term does not include:

(i) An agency of the state or unit of local government which acquired ownership or control involuntarily through bankruptcy, tax delinquency, abandonment, or circumstances in which the government involuntarily acquires title. This exclusion does not apply to an agency of the state or unit of local government which has caused or contributed to the release or threatened release of a hazardous substance from the facility; or

(ii) A person who, without participating in the management of a facility, holds indicia of ownership primarily to protect the person's security interest in the facility.

(7) "Person" means an individual, firm, corporation, association, partnership, consortium, joint venture, commercial entity, state government agency, unit of local government, federal government agency, or Indian tribe.

(8) "Potentially liable person" means any person whom the department finds, based on credible evidence, to be liable under RCW 70.105D.040. The department shall give notice to any such person and allow an opportunity for comment before making the finding, unless an emergency requires otherwise.

(9) "Public notice" means, at a minimum, adequate notice mailed to all persons who have made timely request of the department and to persons residing in the potentially affected vicinity of the proposed action; mailed to appropriate news media; published in the newspaper of largest circulation in the city or county of the proposed action; and opportunity for interested persons to comment.

(10) "Release" means any intentional or unintentional entry of any hazardous substance into the environment, including but not limited to the abandonment or disposal of containers of hazardous substances.

(11) "Remedy" or "remedial action" means any action or expenditure consistent with the purposes of this chapter to identify, eliminate, or minimize any threat or potential threat posed by hazardous substances to human health or the environment including any investigative and monitoring activities with respect to any release or threatened release of a hazardous substance and any health assessments or health effects studies conducted in order to determine the risk or potential risk to human health. [1989 c 2 § 2 (Initiative Measure No. 97, approved November 8, 1988).]

70.105D.030 Department's powers and duties. (1) The department may exercise the following powers in addition to any other powers granted by law:

(a) Investigate, provide for investigating, or require potentially liable persons to investigate any releases or threatened releases of hazardous substances, including but

not limited to inspecting, sampling, or testing to determine the nature or extent of any release or threatened release. If there is a reasonable basis to believe that a release or threatened release of a hazardous substance may exist, the department's authorized employees, agents, or contractors may enter upon any property and conduct investigations. The department shall give reasonable notice before entering property unless an emergency prevents such notice. The department may by subpoena require the attendance or testimony of witnesses and the production of documents or other information that the department deems necessary;

(b) Conduct, provide for conducting, or require potentially liable persons to conduct remedial actions (including investigations under (a) of this subsection) to remedy releases or threatened releases of hazardous substances. In carrying out such powers, the department's authorized employees, agents, or contractors may enter upon property. The department shall give reasonable notice before entering property unless an emergency prevents such notice. In conducting, providing for, or requiring remedial action, the department shall give preference to permanent solutions to the maximum extent practicable and shall provide for or require adequate monitoring to ensure the effectiveness of the remedial action;

(c) Indemnify contractors retained by the department for carrying out investigations and remedial actions, but not for any contractor's reckless or wilful misconduct;

(d) Carry out all state programs authorized under the federal cleanup law and the federal resource, conservation, and recovery act, 42 U.S.C. Sec. 6901 et seq., as amended;

(e) Classify substances as hazardous substances for purposes of RCW 70.105D.020(5) and classify substances and products as hazardous substances for purposes of RCW 82.21.020(1); and

(f) Take any other actions necessary to carry out the provisions of this chapter, including the power to adopt rules under chapter 34.05 RCW.

(2) The department shall immediately implement all provisions of this chapter to the maximum extent practicable, including investigative and remedial actions where appropriate. The department, within nine months after March 1, 1989, shall adopt, and thereafter enforce, rules under chapter 34.05 RCW to:

(a) Provide for public participation, including at least (i) the establishment of regional citizen's advisory committees, (ii) public notice of the development of investigative plans or remedial plans for releases or threatened releases, and (iii) concurrent public notice of all compliance orders, enforcement orders, or notices of violation;

(b) Establish a hazard ranking system for hazardous waste sites;

(c) Establish reasonable deadlines not to exceed ninety days for initiating an investigation of a hazardous waste site after the department receives information that the site may pose a threat to human health or the environment and other reasonable deadlines for remedying releases or threatened releases at the site; and

(d) Publish and periodically update minimum cleanup standards for remedial actions at least as stringent as the cleanup standards under section 121 of the federal cleanup law, 42 U.S.C. Sec. 9621, and at least as stringent as all

applicable state and federal laws, including health-based standards under state and federal law.

(3) Before November 1st of each even-numbered year, the department shall develop, with public notice and hearing, and submit to the ways and means and appropriate standing environmental committees of the senate and house of representatives a ranked list of projects and expenditures recommended for appropriation from both the state and local toxics control accounts. The department shall also provide the legislature and the public each year with an accounting of the department's activities supported by appropriations from the state toxics control account, including a list of known hazardous waste sites and their hazard rankings, actions taken and planned at each site, how the department is meeting its top two management priorities under RCW 70.105.150, and all funds expended under this chapter.

(4) The department shall establish a scientific advisory board to render advice to the department with respect to the hazard ranking system, cleanup standards, remedial actions, deadlines for remedial actions, monitoring, the classification of substances as hazardous substances for purposes of RCW 70.105D.020(5) and the classification of substances or products as hazardous substances for purposes of RCW 82.21.020(1). The board shall consist of five independent members to serve staggered three-year terms. No members may be employees of the department. Members shall be reimbursed for travel expenses as provided in RCW 43.03.050 and 43.03.060.

(5) The department shall establish a program to identify potential hazardous waste sites and to encourage persons to provide information about hazardous waste sites. [1989 c 2 § 3 (Initiative Measure No. 97, approved November 8, 1988).]

70.105D.040 Standard of liability. (1) Except as provided in subsection (3) of this section, the following persons are liable with respect to a facility:

- (a) The owner or operator of the facility;
- (b) Any person who owned or operated the facility at the time of disposal or release of the hazardous substances;
- (c) Any person who owned or possessed a hazardous substance and who by contract, agreement, or otherwise arranged for disposal or treatment of the hazardous substance at the facility, or arranged with a transporter for transport for disposal or treatment of the hazardous substances at the facility, or otherwise generated hazardous wastes disposed of or treated at the facility;
- (d) Any person (i) who accepts or accepted any hazardous substance for transport to a disposal, treatment, or other facility selected by such person from which there is a release or a threatened release for which remedial action is required, unless such facility, at the time of disposal or treatment, could legally receive such substance; or (ii) who accepts a hazardous substance for transport to such a facility and has reasonable grounds to believe that such facility is not operated in accordance with chapter 70.105 RCW; and

(e) Any person who both sells a hazardous substance and is responsible for written instructions for its use if (i) the substance is used according to the instructions and (ii) the use constitutes a release for which remedial action is required at the facility.

(2) Each person who is liable under this section is strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the releases or threatened releases of hazardous substances. The attorney general, at the request of the department, is empowered to recover all costs and damages from persons liable therefor.

(3) The following persons are not liable under this section:

(a) Any person who can establish that the release or threatened release of a hazardous substance for which the person would be otherwise responsible was caused solely by:

(i) An act of God;

(ii) An act of war; or

(iii) An act or omission of a third party (including but not limited to a trespasser) other than (A) an employee or agent of the person asserting the defense, or (B) any person whose act or omission occurs in connection with a contractual relationship existing, directly or indirectly, with the person asserting this defense to liability. This defense only applies where the person asserting the defense has exercised the utmost care with respect to the hazardous substance, the foreseeable acts or omissions of the third party, and the foreseeable consequences of those acts or omissions;

(b) Any person who is an owner, past owner, or purchaser of a facility and who can establish by a preponderance of the evidence that at the time the facility was acquired by the person, the person had no knowledge or reason to know that any hazardous substance, the release or threatened release of which has resulted in or contributed to the need for the remedial action, was released or disposed of on, in, or at the facility. This subsection (b) is limited as follows:

(i) To establish that a person had no reason to know, the person must have undertaken, at the time of acquisition, all appropriate inquiry into the previous ownership and uses of the property, consistent with good commercial or customary practice in an effort to minimize liability. Any court interpreting this subsection (b) shall take into account any specialized knowledge or experience on the part of the person, the relationship of the purchase price to the value of the property if uncontaminated, commonly known or reasonably ascertainable information about the property, the obviousness of the presence or likely presence of contamination at the property, and the ability to detect such contamination by appropriate inspection;

(ii) The defense contained in this subsection (b) is not available to any person who had actual knowledge of the release or threatened release of a hazardous substance when the person owned the real property and who subsequently transferred ownership of the property without first disclosing such knowledge to the transferee;

(iii) The defense contained in this subsection (b) is not available to any person who, by any act or omission, caused or contributed to the release or threatened release of a hazardous substance at the facility;

(c) Any natural person who uses a hazardous substance lawfully and without negligence for any personal or domestic purpose in or near a dwelling or accessory structure when that person is: (i) A resident of the dwelling; (ii) a person who, without compensation, assists the resident in the use of

the substance; or (iii) a person who is employed by the resident, but who is not an independent contractor.

(d) Any person who, for the purpose of growing food crops, applies pesticides or fertilizers without negligence and in accordance with all applicable laws and regulations.

(4) There may be no settlement by the state with any person potentially liable under this chapter except in accordance with this subsection.

(a) The attorney general may agree to a settlement with any potentially liable person only if the department finds, after public notice and hearing, that the proposed settlement would lead to a more expeditious cleanup of hazardous substances in compliance with cleanup standards under RCW 70.105D.030(2)(d) and with any remedial orders issued by the department. Whenever practicable and in the public interest, the attorney general may expedite such a settlement with persons whose contribution is insignificant in amount and toxicity.

(b) A settlement agreement under this subsection shall be entered as a consent decree issued by a court of competent jurisdiction.

(c) A settlement agreement may contain a covenant not to sue only of a scope commensurate with the settlement agreement in favor of any person with whom the attorney general has settled under this section. Any covenant not to sue shall contain a reopener clause which requires the court to amend the covenant not to sue if factors not known at the time of entry of the settlement agreement are discovered and present a previously unknown threat to human health or the environment.

(d) A party who has resolved its liability to the state under this subsection shall not be liable for claims for contribution regarding matters addressed in the settlement. The settlement does not discharge any of the other liable parties but it reduces the total potential liability of the others to the state by the amount of the settlement.

(5) Nothing in this chapter affects or modifies in any way any person's right to seek or obtain relief under other statutes or under common law, including but not limited to damages for injury or loss resulting from a release or threatened release of a hazardous substance. No settlement by the department or remedial action ordered by a court or the department affects any person's right to obtain a remedy under common law or other statutes. [1989 c 2 § 4 (Initiative Measure No. 97, approved November 8, 1988).]

70.105D.050 Enforcement. (1) With respect to any release, or threatened release, for which the department does not conduct or contract for conducting remedial action and for which the department believes remedial action is in the public interest, the director shall issue orders requiring potentially liable persons to provide the remedial action. Any liable person who refuses, without sufficient cause, to comply with an order of the director is liable in an action brought by the attorney general for:

(a) Up to three times the amount of any costs incurred by the state as a result of the party's refusal to comply; and

(b) A civil penalty of up to twenty-five thousand dollars for each day the party refuses to comply. The treble damages and civil penalty under this subsection apply to all recovery actions filed on or after March 1, 1989.

(2) Any person who incurs costs complying with an order issued under subsection (1) of this section may petition the department for reimbursement of those costs. If the department refuses to grant reimbursement, the person may within thirty days thereafter file suit and recover costs by proving that he or she was not a liable person under RCW 70.105D.040 and that the costs incurred were reasonable.

(3) The attorney general shall seek, by filing an action if necessary, to recover the amounts spent by the department for investigative and remedial actions and orders, including amounts spent prior to March 1, 1989.

(4) The attorney general may bring an action to secure such relief as is necessary to protect human health and the environment under this chapter.

(5)(a) Any person may commence a civil action to compel the department to perform any nondiscretionary duty under this chapter. At least thirty days before commencing the action, the person must give notice of intent to sue, unless a substantial endangerment exists. The court may award attorneys' fees and other costs to the prevailing party in the action.

(b) Civil actions under this section and RCW 70.105D.060 may be brought in the superior court of Thurston county or of the county in which the release or threatened release exists. [1989 c 2 § 5 (Initiative Measure No. 97, approved November 8, 1988).]

70.105D.060 Timing of review. The department's investigative and remedial decisions under RCW 70.105D.030 and 70.105D.050 and its decisions regarding liable persons under RCW 70.105D.020(8) and 70.105D.040 shall be reviewable exclusively in superior court and only at the following times: (1) In a cost recovery suit under RCW 70.105D.050(3); (2) in a suit by the department to enforce an order or seek a civil penalty under this chapter; (3) in a suit for reimbursement under RCW 70.105D.050(2); (4) in a suit by the department to compel investigative or remedial action; and (5) in a citizen's suit under RCW 70.105D.050(5). The court shall uphold the department's actions unless they were arbitrary and capricious. [1989 c 2 § 6 (Initiative Measure No. 97, approved November 8, 1988).]

70.105D.070 Toxics control accounts. (1) The state toxics control account and the local toxics control account are hereby created in the state treasury.

(2) The following moneys shall be deposited into the state toxics control account: (a) Those revenues which are raised by the tax imposed under RCW 82.21.030 and which are attributable to that portion of the rate equal to thirty-three one-hundredths of one percent; (b) the costs of remedial actions recovered under this chapter or chapter 70.105A RCW; (c) penalties collected or recovered under this chapter; and (d) any other money appropriated or transferred to the account by the legislature. Moneys in the account may be used only to carry out the purposes of this chapter, including but not limited to the following activities:

(i) The state's responsibility for hazardous waste planning, management, regulation, enforcement, technical assistance, and public education required under chapter 70.105 RCW;

(ii) The state's responsibility for solid waste planning, management, regulation, enforcement, technical assistance, and public education required under chapter 70.95 RCW;

(iii) The hazardous waste cleanup program required under this chapter;

(iv) State matching funds required under the federal cleanup law;

(v) Financial assistance for local programs in accordance with RCW 70.95.130, 70.95.140, 70.95.220, 70.95.230, 70.95.530, 70.105.220, 70.105.225, 70.105.235, and 70.105.260;

(vi) State government programs for the safe reduction, recycling, or disposal of hazardous wastes from households, small businesses, and agriculture;

(vii) Hazardous materials emergency response training;

(viii) Water and environmental health protection and monitoring programs;

(ix) Programs authorized under chapter 70.146 RCW;

(x) A public participation program, including regional citizen advisory committees;

(xi) Public funding to assist potentially liable persons to pay for the costs of remedial action in compliance with cleanup standards under RCW 70.105D.030(2)(d) but only when the amount and terms of such funding are established under a settlement agreement under RCW 70.105D.040(4) and when the director has found that the funding will achieve both (A) a substantially more expeditious or enhanced cleanup than would otherwise occur, and (B) the prevention or mitigation of unfair economic hardship; and

(xii) Development and demonstration of alternative management technologies designed to carry out the top two hazardous waste management priorities of RCW 70.105.150.

(3) The following moneys shall be deposited into the local toxics control account: Those revenues which are raised by the tax imposed under RCW 82.21.030 and which are attributable to that portion of the rate equal to thirty-seven one-hundredths of one percent. Moneys deposited in the local toxics control account shall be used by the department for grants to local governments for the following purposes in descending order of priority: (a) Remedial actions; (b) hazardous waste plans and programs under RCW 70.105.220, 70.105.225, 70.105.235, and 70.105.260; and (c) solid waste plans and programs under RCW 70.95.130, 70.95.140, 70.95.220, and 70.95.230. Funds for plans and programs shall be allocated consistent with the priorities and matching requirements established in chapters 70.105 and 70.95 RCW.

(4) Except for unanticipated receipts under RCW 43.79.260 through 43.79.282, moneys in the state and local toxics control accounts may be spent only after appropriation by statute.

(5) One percent of the moneys deposited into the state and local toxics control accounts shall be allocated only for public participation grants to persons who may be adversely affected by a release or threatened release of a hazardous substance and to not-for-profit public interest organizations. The primary purpose of these grants is to facilitate the participation by persons and organizations in the investigation and remedying of releases or threatened releases of hazardous substances and to implement the state's solid and hazardous waste management priorities. No grant may exceed fifty thousand dollars though it may be renewed

annually. Moneys appropriated for public participation from either account which are not expended at the close of any biennium shall revert to the state toxics control account.

(6) No moneys deposited into either the state or local toxics control account may be used for solid waste incinerator feasibility studies, construction, maintenance, or operation.

(7) The department shall adopt rules for grant issuance and performance. [1991 sp.s. c 13 § 69; 1989 c 2 § 7 (Initiative Measure No. 97, approved November 8, 1988).]

Effective date—Severability—1991 sp.s. c 13: See notes following RCW 18.06.240.

70.105D.900 Short title—1989 c 2. This act shall be known as "the model toxics control act." [1989 c 2 § 22 (Initiative Measure No. 97, approved November 8, 1988).]

70.105D.905 Captions—1989 c 2. As used in this act, captions constitute no part of the law. [1989 c 2 § 21 (Initiative Measure No. 97, approved November 8, 1988).]

70.105D.910 Construction—1989 c 2. The provisions of this act are to be liberally construed to effectuate the policies and purposes of this act. In the event of conflict between the provisions of this act and any other act, the provisions of this act shall govern. [1989 c 2 § 19 (Initiative Measure No. 97, approved November 8, 1988).]

70.105D.915 Existing agreements—1989 c 2. The consent orders and decrees in effect on March 1, 1989, shall remain valid and binding. [1989 c 2 § 20 (Initiative Measure No. 97, approved November 8, 1988).]

70.105D.920 Effective date—1989 c 2. (1) Sections 1 through 24 of this act shall take effect March 1, 1989, except that the director of ecology and the director of revenue may take whatever actions may be necessary to ensure that sections 1 through 24 of this act are implemented on their effective date.

*(2) This section does not apply and shall have no force or effect if (a) this act is passed by the legislature in the 1988 regular session or (b) no bill is enacted by the legislature involving hazardous substance cleanup (along with any other subject matter) between August 15, 1987, and January 1, 1988. [1989 c 2 § 26 (Initiative Measure No. 97, approved November 8, 1988).]

*Reviser's note: Neither condition contained in subsection (2) was met.

70.105D.921 Severability—1989 c 2. If any provision of this act or its application to any person or circumstance is held invalid, the remainder of the act or the application of the provision to other persons or circumstances is not affected. [1989 c 2 § 18 (Initiative Measure No. 97, approved November 8, 1988).]

APPENDIX 5

Waterfront Regeneration Trust Publications Update

Bibliography of the Royal Commission on the Future of Toronto's Waterfront

In addition to this final report, the Commission has published 15 major discussion papers, two interim reports, 11 working papers, and 12 technical papers. In general, each one summarized plans and initiatives in a subject area; highlighted issues that require the attention of all levels of government if the waterfront is to achieve its highest potential; and identified new opportunities that could be pursued if there were greater co-ordination in the work of all governments and public authorities.

The Royal Commission also published 13 issues of the Newsletter of the Canadian Waterfront Resource Centre (ISSN 0840-9846), in order to increase public awareness of issues and policy directions.

Discussion Papers

1. *Environment and Health: Issues on the Toronto Waterfront*. 1989. Royal Commission on the Future of the Toronto Waterfront. Environment and Health Work Group. ISBN 0-662-16539-2. DSS cat. no. Z1-1988/1-41-1E.

Examines the existing policy framework as it affects environment and health in relation to Metropolitan Toronto's waterfront and suggests improvements. Focuses on six topics that illustrate many of the environmental and health issues of the waterfront ecosystem: water quality, lake-filling, heritage preservation, natural areas and wildlife, public involvement, and jurisdictions. Recurrent themes include the principle of sustainability, the goal of virtually eliminating toxic substances, and the ecosystem approach.

Bibliography.

2. *Housing and Neighbourhoods: The Liveable Waterfront*. 1989. Royal Commission on the Future of the Toronto Waterfront. Housing and Neighbourhoods Work Group. ISBN 0-662-16936-0. DSS cat. no. Z1-1988/1-41-2E.

Discusses housing and neighbourhoods on or close to the Metro lakeshore: opportunities exist for protecting the environment and enhancing existing neighbourhoods while, at the same time, doubling the waterfront population through sensitive intensification of present communities and careful development of new neighbourhoods. Identifies key policy goals, and makes recommendations on how these can be achieved in terms of affordability, planning and design controls, government co-ordination and accountability. Appendix includes a statistical profile (up to 1988) of Metropolitan Toronto, the three lakefront municipalities, and the constituent waterfront areas of each. (These statistics are updated in the Royal Commission working paper, *Greater Toronto Region and Waterfront: Community Overview*.)

3. *Access and Movement*. 1989. Royal Commission on the Future of the Toronto Waterfront. Access and Movement Work Group. ISBN 0-662-16937-9. DSS cat. no. Z1-1988/1-41-3E.

Proposes a network of transportation types to and along the waterfront, with particular attention to the way modes interact and support one another. Included in this transportation framework are waterfront transportation centres, where different forms of transport come together, and where there are possibilities for development and access to the water. Discusses many kinds of networks: trails and walkways, bicycles, parking lots, streetcars

and buses, GO Transit – as well as waterfront scenic drives, extensions of north-south roads, visual access, recreational boating, and cruises. Maps include: existing transportation infrastructure; the proposed transportation framework; local issues on the Metro Toronto waterfront; and local issues on the central area waterfront.

Bibliography.

4. *Parks, Pleasures, and Public Amenities*. 1989. Royal Commission on the Future of the Toronto Waterfront. Parks, Pleasures, and Public Amenities Work Group. ISBN 0-662-16936-0. DSS cat. no. Z1-1988/1-41-4E.

Looks at open space and recreational issues along the Metropolitan Toronto waterfront. There is an inventory of existing recreational facilities along the waterfront, followed by an examination of policies, plans, and projects currently in effect or under active consideration by various public agencies, private developers, and other waterfront interests. Identifies new opportunities to improve public enjoyment of the waterfront, emphasizing general policy goals and implementation strategies. Useful appendices include "Institutional Framework", information on mandates, powers, and approaches of the major waterfront agents on the waterfront, at all levels of government. Reading list.

5. *Jobs, Opportunities, and Economic Growth*. 1989. Royal Commission on the Future of the Toronto Waterfront. Jobs, Opportunities, and Economic Growth Work Group. ISBN 0-662-16939-5. DSS cat. no. Z1-1988/1-41-5E.

Recommends a working waterfront for Metropolitan Toronto, examines plans for the 12 geographical areas on the waterfront, and identifies the major issues and redevelopment opportunities related to those plans. Proposes policy initiatives that might be used to encourage industries to remain or relocate on the waterfront. Bibliography.

6. *Persistence and Change: Waterfront Issues and the Board of Toronto Harbour Commissioners*. 1989. Royal Commission on the Future of the Toronto Waterfront. Steering Committee on Matters Relating to the Board of Toronto Harbour Commissioners. ISBN 0-662-16966-2. DSS cat. no. Z1-1988/1-41-6E.

Focuses on issues associated with Toronto's port and waterfront, examining issues in terms of their history and the future, with a view to developing a broad perspective on the port and, more generally, the Toronto waterfront. Not all waterfront issues considered in this report are exclusively within the mandate of the Toronto Harbour Commissioners (THC), but because they are important to the community as a whole, they may shape expectations of the THC. Covers such issues as access, environment and health, the port, ownership, land use, and accountability.

7. *The Future of the Toronto Island Airport: The Issues*. 1989. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-17067-9. DSS cat. no. Z1-1988/1-41-7E.

Evaluates issues involving the Toronto Island Airport, related transportation services, the need to develop strategic options that will meet the needs of the aviation companies, the travelling public, and the overall interests of all users of Toronto's waterfront. Describes the airport's origins and history, reviews submissions of more than 50 deputants at Commission hearings on the airport, and proposes a number of approaches to making decisions about the airport's future. Bibliography.

8. *A Green Strategy for the Greater Toronto Waterfront: Background and Issues: A Discussion Paper*. 1990. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-17671-5. DSS cat. no. Z1-1988/1-41-8E.

Complements Royal Commission Publication no. 4, *Parks, Pleasures, and Public Amenities*; summarizes information on current ecological, recreational, and public uses and values along the Greater Toronto waterfront and associated river valleys, as well as the progress of public agencies in maintaining or creating waterfront open space and recreational facilities. Identifies gaps in and barriers to a linked system of waterfront and valley-land green spaces, and discusses issues and opportunities that should be addressed by a Green Strategy, as well as actions necessary to implement such a strategy. Three appendices: summary of regional and local municipality waterfront policies; regional and municipal planning documents and related studies; and specific issues and opportunities in waterfront municipalities. Bibliography.

9. *Waterfront Transportation in the Context of Regional Transportation: Background and Issues*. 1990. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-17730-4. DSS cat. no. Z1-1988/1-52-2E.

Discussion paper describes existing and potential future transportation demand, facilities, and services, for the Greater Toronto Area and for the GTA waterfront in particular. Presents examples of interactions between provision of transportation infrastructure and land use. The final chapter poses questions which can serve as criteria in developing and evaluating alternative transportation concepts for the waterfront. Maps include existing transportation infrastructure, and Lake Shore Corridor transportation concept.

10. *Environment in Transition: A Report on Phase I of an Environmental Audit of Toronto's East Bayfront and Port Industrial Area*. 1990. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-17847-5. DSS cat no. Z1-1988/1-52-3E.

Using the ecosystem approach, Phase I of the environmental audit seeks to understand connections and interactions among terrestrial, aquatic, and atmospheric components of the environment and human activities in the East Bayfront/Port Industrial Area. Existing information on environmental conditions in the study area is reviewed, information gaps are identified, and a number of options for research in Phase II are proposed. Publication accompanied by Phase I technical papers: *Atmospheric Environment, Built Heritage, Natural Heritage, Soils and Groundwater, Aquatic Environment*.

11. *Pathways: Towards an Ecosystem Approach: A Report on Phases I and II of an Environmental Audit of Toronto's East Bayfront and Port Industrial Area*. 1991. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-18577-3. DSS cat no. Z1-1988/1-41-11E.

Phase II of the audit provides a better understanding of the environmental conditions of the East Bayfront/Port Industrial Area. Describes the physical structures of the study area ecosystem, including their historical development. Examines how the ecosystem functions, and makes a preliminary assessment of ecosystem health. Discusses the ecosystem approach, the notion of ecosystem integrity, and the ways in which decisions are

made about ecosystems, including issues of stewardship and accountability. Proposes 29 recommendations toward improving ecosystem integrity in the East Bayfront/Port Industrial Area. Includes maps and bibliography. Publication accompanied by Phase II technical papers: *Atmospheric Environment, Built Heritage of the East Bayfront, Ecosystem Health: A Biophysical Perspective, Hazardous Materials, Natural Heritage, Soils and Groundwater, Water and Sediments*.

12. *Planning for Sustainability: Towards Integrating Environmental Protection into Land-Use Planning*. 1991. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-18929-9. DSS cat. no. Z1-1988/1-41-12E.

Discusses better ways to integrate environmental and land-use planning in order to promote environmentally sustainable economic development adequate to the needs of the region during the next decade. Examines various problems in Ontario's existing land-use planning and environmental assessment process, and the need for reform. Suggests reforms that could immediately improve the system, and calls for a public inquiry to study and consult on the issues before any recommendations can be made to government on whether and how to develop a fully integrated system. Appendices, including one, "Towards an Ecosystem Approach to Land-Use Planning", that proposes a way in which growth and development could be planned.

13. *Shoreline Regeneration for the Greater Toronto Bioregion*. 1991. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-18981-7. DSS cat. no. Z1-1988/1-41-13E.

Examines policies, practices, technology, and methods available to regenerate shoreline areas. Addresses the public's desire for the benefits of shoreline modification and its desire to avoid the negative consequences of previous projects. Suggests that correction can come only from a coordinated, planned approach based on the conviction that the benefits of regeneration will far exceed the effort expended. Recommends leadership by the two senior levels of government in development and implementation, and public input to achieve understanding, acceptance, and support for the goals, objectives, and constraints of the plan. Bibliography.

14. *Garrison Common: Preliminary Master Plan*. 1991. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-19121-8. DSS cat. no. Z1-1988/1-41-14E.

Offers innovative recommendations for regenerating the environment and economy of Garrison Common and enhancing surrounding neighbourhoods. Covers such sites as Fort York, Exhibition Place, Ontario Place, Coronation Park, HMCS York, the Tip Top Tailor building, the old Loblaw's warehouse, the Massey-Ferguson works, and the Molson holdings. Seeks to establish year-round use of the area, high-activity, public, urban waterfront parks, making the Common a permanent home for a wider range of regional outdoor/indoor events. Appendix and bibliography published separately.

15. *Toronto Central Waterfront Transportation Corridor Study*. 1991. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-19248-6. DSS cat. no. Z1-1988/1-41-15E

Sets out transportation options for the Toronto Central Waterfront; identifies the environmental, land-use, urban design, and economic opportunities and concepts they help make possible; the required financial resources and related risks; proposes a program aimed at achieving these cost effectively. Envisions a redesigned and relocated Gardiner Expressway/Lake Shore Boulevard facility to help strengthen the links between the city and its renewed Central Waterfront and to improve the area's quality as a place, while maintaining and enhancing its essential function as a transportation corridor. Maps.

Interim Report, August 1989. 1989. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-17215-9. DSS cat. no. Z1-1988/1E.

The Royal Commission's first interim report discusses the future of the Toronto Island Airport; the role, mandate, and development plans of the Harbourfront Corporation; the role and mandate of the Toronto Harbour Commissioners, as well as various environment and health issues. Findings are based on research studies and public hearings, at which more than 300 groups and individuals made submissions. Interjurisdictional recommendations ensure that public benefits are among the considerations shaping future development of the

waterfront. Bibliography. A working paper, published separately, is *An Index to the First Interim Report of the Royal Commission on the Future of the Toronto Waterfront, August 1989*.

Watershed: Interim Report, August 1990. 1990. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-18012-7. DSS cat. no. Z1-1988/1-62-1990E.

Watershed, the Royal Commission's second interim report, calls for an ecosystem approach to planning the waterfront and the Greater Toronto Bioregion; provides nine guiding principles; and directs 80 recommendations to various levels of government. Written in three main sections: explaining the ecosystem approach and analysing the state of the health of the Greater Toronto Bioregion; proposing principles that should guide policy and planning; addressing area-wide and area-specific issues. Submits that the Greater Toronto waterfront from Burlington to Newcastle should be clean, green, useable, diverse, open, accessible, connected, affordable, and attractive. Index and references.

Working Papers

Working papers provide a public forum for addressing various waterfront issues that warrant research and discussion.

1. Merrens, H. R. 1989. *A Selected Bibliography on Toronto's Port and Waterfront*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-17596-4. DSS cat. no. Z1-1988/1-42-1E.

Intended as a guide to the diversity of material pertaining to Toronto's port and waterfront produced in recent years by a variety of people, including scholars, journalists, architects, planners, engineers, and others. Bibliographical entries.

2. Clark, N. J. 1990. *An Index to the First Interim Report of the Royal Commission on the Future of the Toronto Waterfront, August 1989*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-17597-2. DSS cat. no. Z1-1988/1-42-2E.

The 600 headings include personal names, government bodies, corporations, geographical locations, and subject terms.

3. Munson, W. 1990. *Soil Contamination and Port Redevelopment in Toronto*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-17729-0. DSS cat. no. Z1-1988/1-42-3E.

Draws attention to the legacy of soil contamination left by Toronto's industrial past. Planning decisions for redeveloping the Port Industrial District will need to consider the relative clean-up costs for different uses. Topics include soil contamination, quality of fill material, clean-up costs, port redevelopment schemes, the planning debate, and environmental audits.

4. Lemon, J. 1990. *The Toronto Harbour Plan of 1912: Manufacturing Goals and Economic Realities*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-18005-4. DSS cat. no. Z1-1988/1-42-4E.

Considers why the Toronto Harbour Commissioners (THC) chose manufacturing as the centrepiece of its 1912 plan for the Port Industrial Area and, specifically, what kinds of high value-added industry they hoped to attract. Explains why bulk storage and processing predominated instead.

5. Greenberg, K. and G. Sicheri. 1990. *Toronto's Moveable Shoreline*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-18160-3. DSS cat. no. Z1-1988/1-42-5E.

Examines settlement along the shores of Lake Ontario during the first half of the 19th century, in order to define the nature of early relationships between the City of Toronto and its waterfront. These are compared to conditions that evolved along the central waterfront, as lakefilling continued into the 20th century, in an effort to understand how this has altered the relationship between the metropolitan area and its waterfront. Identifies challenges to establishing necessary city/waterfront links.

6. Gertler, M. S. 1991. *Toronto: The State of the Regional Economy*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-18888-8. DSS cat. no. Z1-1988/1-42-6E.

Analyses the state of Toronto's economy from a regional perspective, describing recent structural

changes to employment, investment, output, and income throughout the region in the past 20 years. Identifies current and future challenges to the region's economic health and underlines the need to realign our way of thinking about economic growth and government's role in fostering it.

7. Munson, W. 1991. *The Disposal of Coal Ash at Toronto's Outer Harbour*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-18902-7. DSS cat. no. Z1-1988/1-42-7E.

Examines land creation at Toronto's Outer Harbour, specifically through the use of coal ash from the R.L. Hearn thermal generating station. Places the Toronto experience in the broader context of world-wide use of waste materials in creating urban land, and comments on the potential environmental implications of this practice. Maps and bibliography.

8. Davies, K. 1991. *Towards Ecosystem-based Planning: A Perspective on Cumulative Environmental Effects*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-19085-8. DSS cat. no. Z1-1988/1-42-8E.

Explores how cumulative environmental effects can be addressed in environmental planning and management in the Greater Toronto Bioregion. These are defined as including social, economic, and biophysical considerations, as well as the interactions among them. Lists individuals and organizations familiar with cumulative environmental effects, and initiatives related to those effects. Bibliography.

9. Klinger, X. 1991. *Metropolitan Toronto Winter Waterfront Study*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-19138-2. DSS cat. no. Z1-1988/1-42-9E.

Presents a strategy for enhancing and increasing year-round public use and enjoyment of the Metropolitan Toronto waterfront. Discusses policies, guidelines, and low-cost initiatives that could be implemented by local and regional municipalities, and by conservation authorities in order to enhance waterfront accessibility, diversity, connectedness, and usability during the colder months. Bibliography.

10. Garland, G. 1991. *Greater Toronto Region and Waterfront: Community Overview*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-19148-X. DSS cat. no. Z1-1988/1-42-10E.

Analyses key social and economic issues on the greater Toronto waterfront, and makes policy proposals. Focuses on population growth, household incomes, housing trends, employment and journeying-to-work according to mode of transportation. Includes statistical municipal and waterfront area community profiles. Bibliography.

Desfor, G. 1990. *Urban Waterfront Industry, Planning and Developing Green Enterprise for the 21st Century: A Report of the Symposium Held on November 16, 1989*. Royal Commission on the Future of the Toronto Waterfront. ISBN 0-662-17640-5. DSS cat. no. Z1-1988/1-52-1E.

Summarizes discussions at a symposium convened to consider new ideas for developing environmentally sound industry on Toronto's port lands. Examines past and current issues, problems, and trends related to industry in the port area. Details potential obstacles to environmentally sound industrial development, and proposes policies likely to overcome them and to encourage appropriate industry in the port lands. Bibliography.

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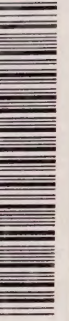
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